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JANUARY 1957—35 CENTS

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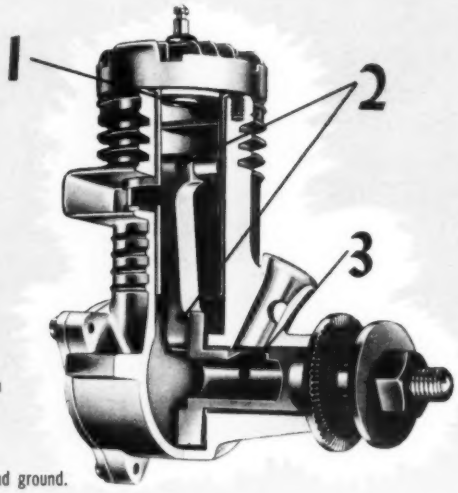

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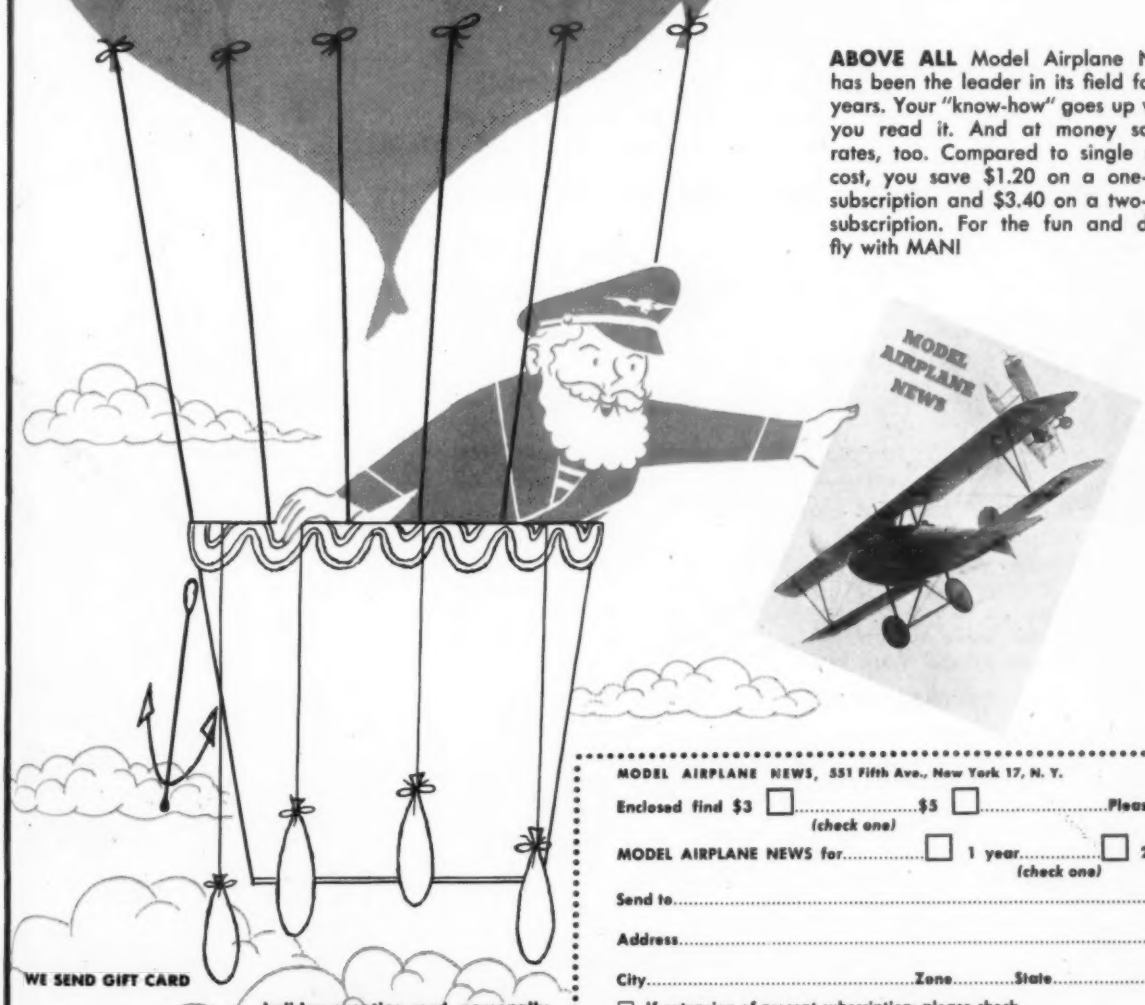

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Contest Calendar

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DECEMBER

9—*Arcadia, Calif.* Class AA Team Racing Contest. Les McBrayer, C.D., 101-B Elm St., Alhambra, Calif.

9—*Bakersfield, Calif.* Nordic Towline and Wakefield Rubber Record Trials. Mathew J. Puskarich, C.D., 1917 Esther Drive, Bakersfield, Calif.

9—*Atlantic City, N.J.* Indoor Control Line Meet. Pending.

16—*Tulare, Calif.* Tulare Sky Kings' Record Trials for all free flight classes. Don Peacock, C.D., 12 Apricot St., Tulare, Calif.

28-31—*Miami, Fla.* Class AAA 3rd King Orange Internationals for FFG, CLC, OHLG, TLG, OR, CLS, CL, CLFS, RC and RR. Charles R. Quick, C.D., 1896 N. W. 36th St., Miami, Fla.

30—*Fresno, Calif.* Fresno Gas Model Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

JANUARY

20—*Phoenix, Ariz.* Record Trials for OR, FFG, OHLG, TLG, CLE and CL. Quentin T. Webster, C.D., 521 E. Camelback Rd., Phoenix, Ariz.

FEBRUARY

24—*Phoenix, Ariz.* Class AAA 7th Annual Southwestern Regional Model Airplane Contest for FFG, CL, OR, TLG, OHLG, CLS, CLC, CLFS and RC. Quentin T. Webster, C.D., 521 E. Camelback Rd., Phoenix, Ariz.

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MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

JANUARY 1957 Vol. LVI No. 1

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ARTICLES

FEATURES

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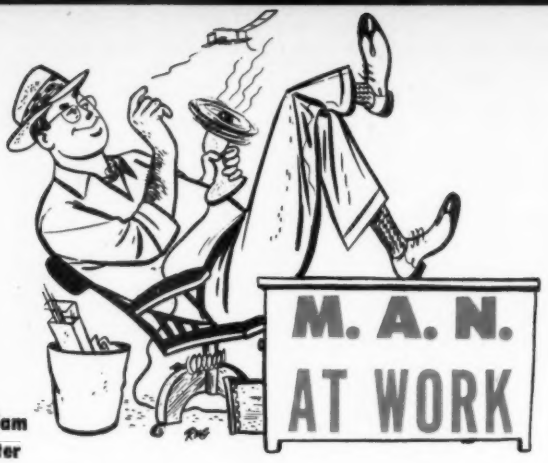

by William Winter

► Few, if any, people have influenced American modeling more than Carl Goldberg, now on his own as a manufacturer as Carl Goldberg Models, or CG, not to be confused with the electronic CG out in New Mexico. From the late twenties until the war, Carl was a perennial indoor winner at the Nationals and, generally, was considered Mr. Indoors. About 1930, Carl turned a square fuselage on end for a diamond, one of the afterwards popular approaches to rubber cabin, as the oft cabinless models were termed in those days. Probably it had been done before but after CG's job the idea stuck.

Carl held national records in ornithopter and helicopter rubber. In the late thirties, on a bet with other Chicagoans, he said that a Forster 99 could be put in a 4½ foot model. Real crazy. But he won. Thus was the Zipper born. Free flight was revolutionized the world over and the pylon model ruled the roost. For steep, groovy climb nothing could touch it and only the relaxation of wing-loading rules eventually gave other kinds of designs a fighting chance against the chomping Zippers. After extensive glide testing in an Armory of 11 wing sections on, gosh knows how many, wings, Carl came up with the Sailplane. The hot Interceptor followed. Denny Davis, whose Hogan was a post war wonder, always credited Carl as the old master. Even Gilliam's Civy Boy was inspired by a need to do something about the tough-to-beat Sailplanes. Theory boys will recall Carl was the bitter enemy of the CLA theory which he said doesn't even exist—and many a butting of heads have we had with Carl. Later-day modelers know Carl as the guy who entered every Nationals, and there have been 25 of those, not counting four years lost to the war. To come to the point, Carl's new company has just released its first kits, the Shoestring, Ranger and Spirit of St. Louis. Sheet balsa, prefabricated, rubber powered, with the emphasis on flying, MAN at Work joins with the industry, his friends and competitors, in wishing Carl the luck he deserves.

• • •

The one model event that offers the full-scale designer's thorny problem in creating an ingenious airplane for a highly specialized purpose, is PAA's Clipper Cargo. Not many of us get to compete in Cargo but we all admire men like Blanchard, Conover, C. O. Wright, who (*Continued on page* 7)

NEXT MONTH'S COVER

Ray Downs and RC Model

PLANE ON THE COVER

Navy's fastest all-weather fighter is the McDonnell F3H-2N, sister to the F3H-2M missile-firing Demon. Powered by Allison J-71 engine, the Demon passed all trial and evaluation tests and is on duty with the Atlantic and Pacific Fleets. Version shown is carrying four interceptor-rocket packages, plus external fuel tanks.

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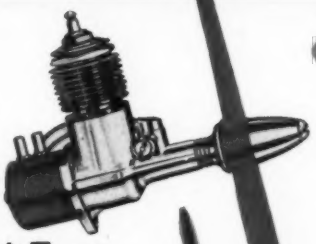

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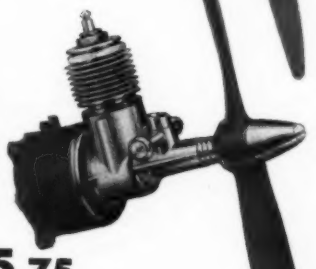
Here's the very latest in this popular series, ideal for both free and control line flight. Mounts flush on the face of the plane, features new lightweight, oversize fuel tank for extra range.



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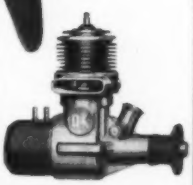

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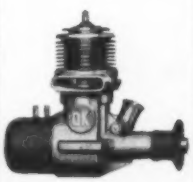

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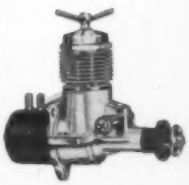

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MAN at Work

(*Continued from page 4*)

can build, then fly a flimsy airplane with .049 power for more than 40 seconds with the unbelievable load of 40 ounces plus. With wings as tall as a man, and a load like that in the middle of a mere few ounces of balsa sticks, it is a tremendous feat to have these weight lifters take off unassisted, climb and turn in a wind, and down-wind, without rolling into a ball. Now, Dallas Sherman and George Gardner, of Pan American World Airways System, have out a questionnaire to sample reactions to possible rules changes. To digress, it is always fascinating to note how rules, any rules, channel design into unexpected directions, dead ends, freak designing, or pleasant surprise. In Clipper Cargo it was considered a wonder of the day when the load passed twenty ounces. With the Mac Diesel the loads struggled up to 30. Surely, no Half A could stay airborne with more! So Cox waved his magic wand and the loads jumped over 40.

The drawback—the inevitable bug—was that weight empty was minimized since it was the payload that paid off. Planes admittedly are too fragile. Ah, now, how about a minimum empty weight? This, we buy. Models will hang together—and who can grind out new ships like sausages?—and all thumbs guys like the writer, addicted to the timbers of RC, have a chance to match wits with the geniuses. You kids, too, though, as in anything, the best man will always win. It is just possible that maximum size will be set at 6 ft. (after all, someone may make us an .049 atomic reactor), and weight empty at 32 ounces.

"What we seek," says PAA, "are models more like real planes, which means an adequate weight-empty allowance to build in all the strength required for reliability, durability, and aerodynamic structural integrity."

• • •

Remember when Mono-Line couldn't get to first base? One-line took 14 firsts and set 10 new records during 1956. Juniors and Seniors set most of these records. Larry Thomas, a junior from Brownwood, Texas, won himself a triple crown, with 85.27 in Half A; 136.72 in B; and 126.71 in A. Larry flew even faster in Half A at the Nats but a timer missed out on the flight. Phil Russell, a senior from Dallas, knocked off 90.60 in Half A and 13.31 in A. Stanzel now is promoting Mono-Line in stunt and combat. The Half A Lil Raider, and the ABC Sky Raider kits are out. Will Mono-Line knock off two-line in stunt as it has in speed?

• • •

And, as we go to press, the control-line endurance mark is up to 34 hours and 34 minutes. Using a four-year old Kenhi Cougar with insulated bellcrank and a float-valve equipped fuel tank, and a Johnson .35, four members of the Orange County (Calif.) Thunderbugs, Keith Lynn, Dick Williams, Phil Gerrard, and Charlie Burnett, flew through a 10-hour thunderstorm. If Ben Franklin could have seen this! Previous attempts, using a Box Car Chief, were aborted several times, twice due to the local gendarmes. Finally, the Kaiser Steel Mill, Fontana, allowed the boys to use the factory parking lot, much to the interest of company officials and crowds of model enthusiasts.

On the technical side, the motor mounts were raised 1⅛ inches to facilitate engine cooling, a 24 cubic-inch tank was installed, and fuel (Ohlsson special Gold Seal) was fed through 55 feet of Ervalite tubing from one-gallon cans strapped to the pilot's shoulder. One gallon was used every 2 to 2.4 hours—no, Jack, the pilot didn't carry all those cans at once. Three auto type filters were installed in the line and, amazingly, no pumping was required. (You don't mean that the Johnson has a 60-foot draw?) Top Flite 10-6 prop. An emergency light on the side of the plane took care of the possibility of parking lot light failure. Dual handles permitted flying left or right handed. Total time on the Johnson at end of flight was 79 hours. Wonderful achievement!

But how long can you fly a U-control model without coming down? MAN at Work's considered judgment is 18 days. All you need, really, is enough fliers for three shifts daily, a well-made motor, and no snow storms. Matter of fact, just an average motor once ran longer than this continuously, as some old timers will remember. And in radio, if personnel relief is allowed, a power model can stay up two days and nights. At least.

• • •

Texans think big. In the provinces we love 'em for it. The Texas Rattlers, a team racing outfit from Fort Worth is attempting to organize a National Team Racing Association, "to promote and improve team racing in the States." The Association would conduct races between member clubs, maintain approved rules, establish and maintain records for heat and feature races. Team Racing sorely needs something like this. Despite the fact that the Rattlers, as founding fathers, sound as if they may end up as the tail trying to wag the dog, all interested clubs should kick around this challenging idea. The scheme should have liaison with the AMA. If team racing addicts nationally want their own rules, they should make them via AMA. But team race people already make rules via AMA. Who is on first? (Write Richard Heist, Texas Rattlers, 4924 Gilbert Drive, Fort Worth, Texas.)

• • •

When the Busy Bee (Wes Levan, 1101 Pine St., Berwick, Pa.) ran a meet last June, they stuck to AMA rules. Few arguments and a lot of good comments. But every Sunday for the rest of the season the Busy Bees attended meets in four states. Very few meets followed AMA rules. "We feel that this is something that will hurt modeling—found plenty of complaints," Levan recounts. "We think the fliers want AMA rules. Here are typical complaints we have: Some meets have no pull tests, some meets have judges not at all familiar with flying, most meets don't have the required numbers of judges, some meets don't give you the proper number of flights, some change the scoring to suit themselves, some count cuts with lines in combat, some allow three or more planes per contestant in combat, and some clubs add trick rules to favor themselves."

All this special rules stuff can end only in chaos if the trend continues. Pet rules may seem devilishly clevah at home but bowing to the majority is supposed to be the democratic way. If we can't follow to the letter rules based upon nationwide selection, we are just a rabble of Sunday afternoon rat racers. How can ukie get so mixed up?

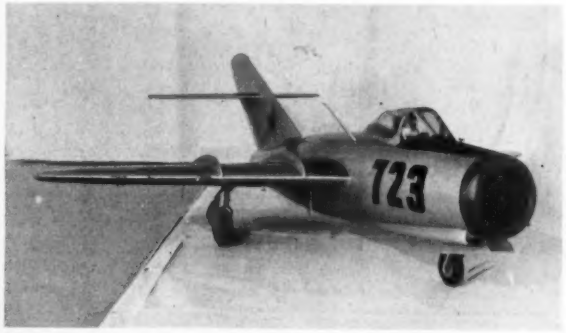
• • •

That Montreal Model Flying Club Bulletin (Mike Sarna, 1429 Valiquette Ave., Verdun, P.K.) is a red-blooded sheet if there ever was one. See that the Bulletin

(*Continued on page 62*)

Dyna-Jet MIG 15

Anyone who has heard at contests the Blat, Blat, Brooom of a starting jet will appreciate this shot of author's MIG straining to take-off.



Wing fences, detailed gear struts, antenna, under-nose cannons, sliding canopy, all help impress the judges if you go for scale!

A thrill to watch but a devil to build is a pulse-jet scale job. But so many readers inquire about internal jet installations that MAN here presents plans of a proved ship.

by HOWARD R. YONKERS

Barrel-shaped MIG is an ideal subject for jet installations. The rakish lines make it oddly attractive airplane for the builder.

► The Russian MIG 15 jet fighter of Korean war fame is probably the best known of all the foreign planes in the world today. Our Dynajet model is equally impressive. Spanning four feet, it is no small ship and its 60-70 MPH speed is not to be sneezed at, for its size and weight.

The MIG is not a model that is recommended for the beginner and the more experienced will find it no small task. A little jet experience will be of great help as jet models perform entirely different than prop jobs.

Use care in selecting wood for the model, for you must keep the weight down. Do not exceed 8 pounds, if possible, otherwise it is hard to handle. But do not sacrifice strength for a saving of weight.

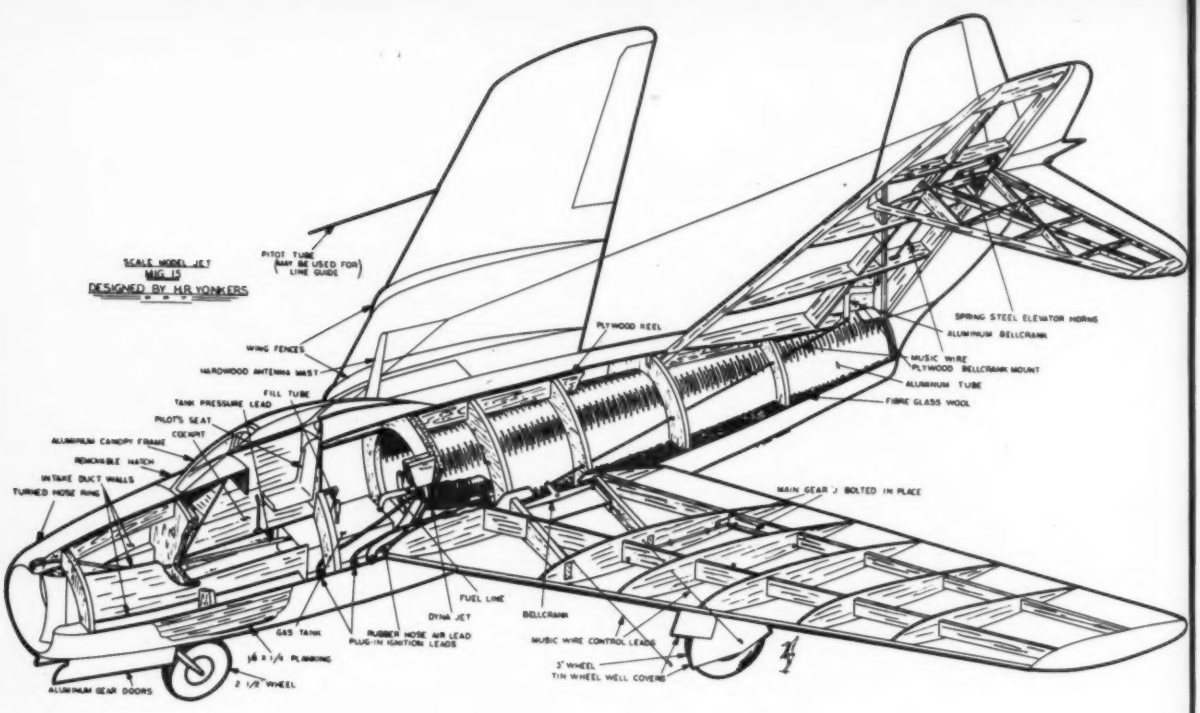
CONSTRUCTION: Have the heat deflector tube constructed of light aluminum at a sheet metal shop. This is bothersome, true, but you would-be scale jet fans are interested in a plane that will not catch fire, as so many scale jobs (internal engines) do after launching.

Bulkheads are slipped in place over the heat tube, after wrapping asbestos strip on the tube at the bulkhead positions. If the tube and bulkheads are modeled to correct size, they will fit snugly at the correct position.

The keel is then slipped in place and remaining bulkheads positioned. When everything has been alined, disassemble, and glue up, using a non inflammable glue such as Wilhold, Elmer's, etc.

Erect fin and stabilizer framework on the fuselage, then install bellcrank mount in wing and auxiliary bellcrank in fin. Use metal hinges for the elevator. Install pushrods—care should be taken to see that both elevators have same setting. Build the basic wing framework into the fuselage, being careful of alinement.

Plank fuselage with ⅛ x ¼ from the 2 to the 4 o'clock positions, and from the 8 to the 10 o'clock positions, looking at the fuselage head on. Cut away lower keel between No. 1 bulkhead and No. 2 bulkhead and install nose gear. All intake duct walls should be installed now with exception of pilot's compartment. It is important not to forget the hatch runners at this point. The entire hatch outline should be built, but do not cut top keel yet. Finish planking fuselage, installing glass wool around tube as you go, making sure the wool is carefully packed (a good source for the wool is a worn out hot-water heater).



Cut out the hatch section, and make pilot's compartment. Detail can be added as the builder sees fit, but a good detailed cockpit sure helps when the plane is being judged in contests. Complete nose area, gas tank, etc., then place engine in model to determine electric lead length and air-line length. Bolt in main gear. Use reflective asbestos sheet (thin) in tank compartment and on outside of cockpit box. Cover wing and stab with 1/16 sheet balsa and make block fillets where called for.

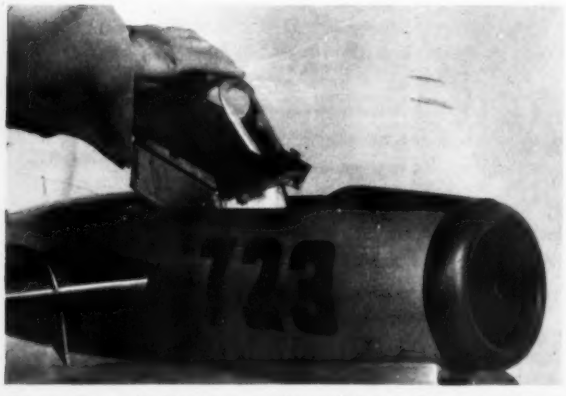
Original model was finished with five coats lacquer auto primer and twenty coats of silver lacquer sprayed on and rubbed down. Extra detail, such as painted nose, anti-glare panel, antenna, should be added now. Locate insignias which are cut from Trim Film. The model should balance level on front lead-out. If needed, use lead BB's for weight to achieve proper balance point.

A good fuel cut-off can be made by using a slightly longer than normal fuel line from tank to engine and wrapping a piece of flex lead-out around it; a pull on the line will crimp it enough to cut the engine when needed; by use of the third line. This third line is a must for scale jet flying for after 10 laps the engine tends to heat up.

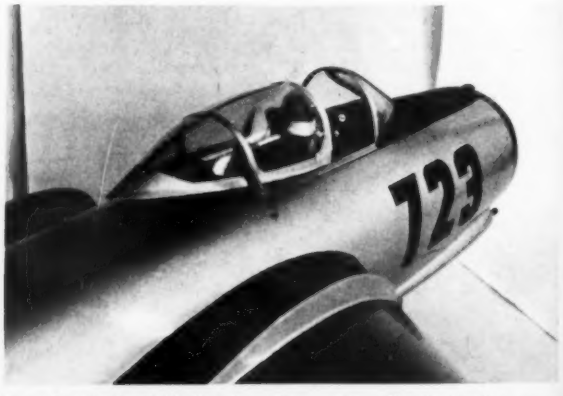
So much for building, now for the flying . . . Start procedure as follows: Just as the pump has started its down stroke, hit the spark and continue until engine starts. If you don't get enough gas, drop tail slightly to help gas flow.

Be sure to take a long take-off run. This is a must and it should be on hard surface if possible and be sure not to stall. If you stall, enough air cannot be taken in for cooling and overheating will occur.

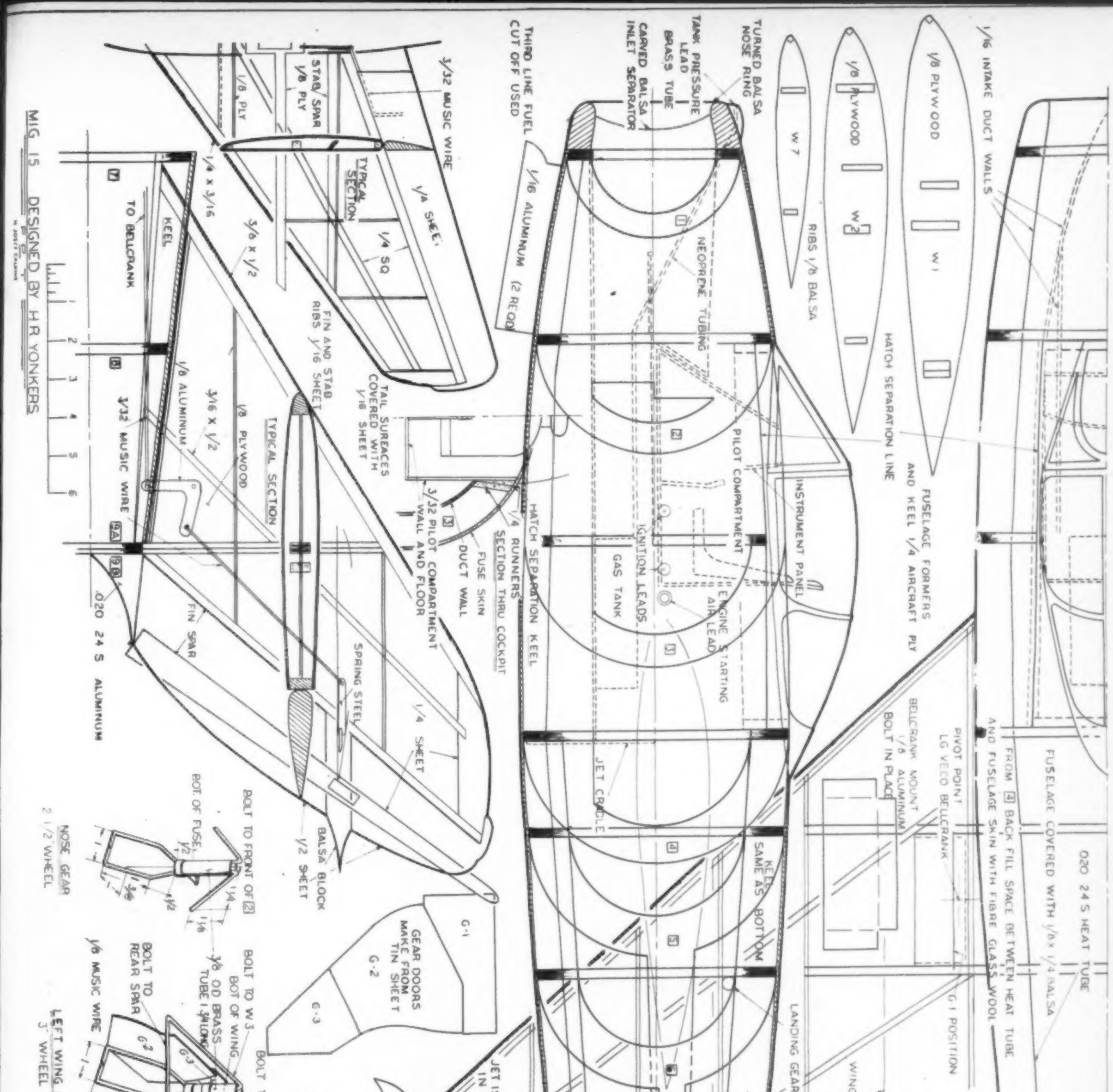
Just follow these few simple hints and I assure you the MIG 15 will reward you in many ways, with good flights, pleasure, and a lot of trophies.



For access to fuel tank, etc., the cockpit details, seat, and so on, assembled inside of this box which lifts out as demonstrated.

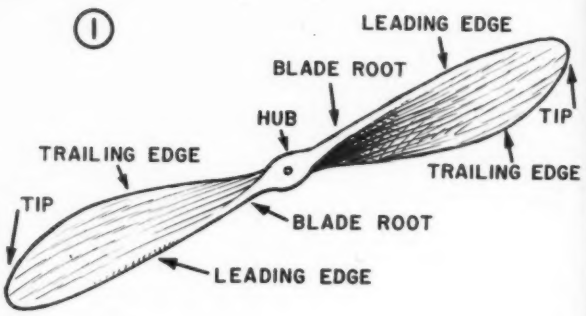


From the back of his head, can't say this pilot is Russian or a Chinese. At four ft. model is big for jet. Max. Wgt. eight lbs.



FULL SIZE PLANS AVAILABLE. SEE PAGE 56.

End of the line in rubber props is the Wakefield "fan." Ron Warring seems awed by this two-bladed folder, a real carving project!



The Great Propeller Mystery

Once upon a time—and this is no fairy story—every modeler carved his own props. Why not today? These how-to-do-it sketches don't look tough!

by CHUCK TRACY & JIM POWELL

► Most important part of a flying model is the propeller. It's also the least understood by the most modelers. You can get a lot of extra "propel" from the right propeller. Or you can sadly limit a good plane's flight by using the wrong one.

Here are some of the common errors of beginners, which sometimes make them wonder if the Wright Brothers really were:

They wind the prop backwards—it turns the wrong way. They put the shaft through the side of the prop, usually on a machine cut prop. They put the prop backwards on the shaft. They use too much blade angle—or too little. They use props with too little diameter. They make blade angles unequal—prop doesn't track or balance. They give blades the wrong cross-section shape.

You mean there really is a "backwards?"—they ask when you suggest changes. So accustomed to pre-fab kits, plastic parts, work all done for them, they can't imagine something so complicated as a propeller being part of a model airplane.

Science of props can be made simple enough for beginners. It is best to start by learning some "engineering" terms and features (Figure 1):

BLADE ANGLE: (Figure 2). Hold a model at arm's length. Have it lined up with your eyes for a perfect side view. Turn the prop to straight up and down position. Note the vertical (up and down) line made by the prop. Now turn the prop so the tip points at you. Notice the "X" formed by the prop blades. The angle made by either blade of the "X" to the up-and-down line of the prop when it was in vertical position is the blade angle. It is measured in degrees—something like 20 degrees or 45 degrees.

PITCH: (Figure 3). The distance a prop screws forward into the air, pulling the plane along with it, in one turn or revolution, is called its pitch. Don't confuse this with blade angle, although the blade angle is what makes pitch. Pitch is measured in inches like "four-inch pitch."

DIAMETER: (Figure 3). The length from tip to tip of the propeller is called diameter because the prop turns in a circle and a line cutting a circle through the center, dividing it into equal parts is called the diameter.

TORQUE: (Figure 4). A force that often puts a model into a nosedown turn, winding up with a spiral-dive. It is air resistance slightly holding back the prop. It turns the plane slightly in the opposite direction of the prop's rotation. You can understand it if you try this: Wind about 50 turns into a rubber job. Hold the prop but release your grip on the model. It will turn wing-over-wingtip, opposite to the way the propeller would turn if free. So much for the terms.

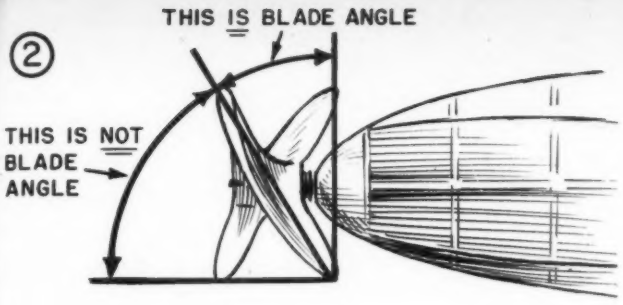
Propeller blades work like a wing. They are set at an angle, have airfoil shape and create lift when turned. This "lift" pulls the plane forward as "thrust." In helicopters it lifts the entire plane up.

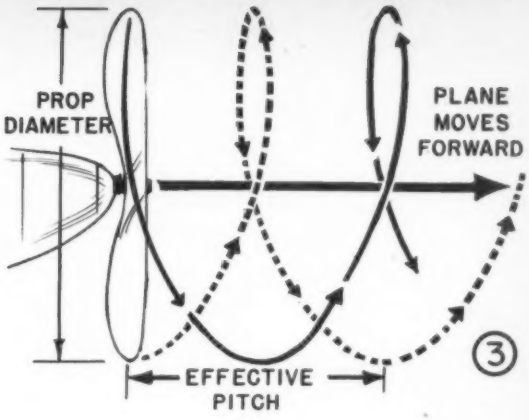
There are "right" and "left" hand props. (Figure 5). A right-hand turns clockwise—same direction as hands of a clock. A left-hand turns "counter-clockwise" or opposite to a clock's hands. But remember: This is true only when you view the spinning prop from the pilot's position in the plane's cabin or cockpit.

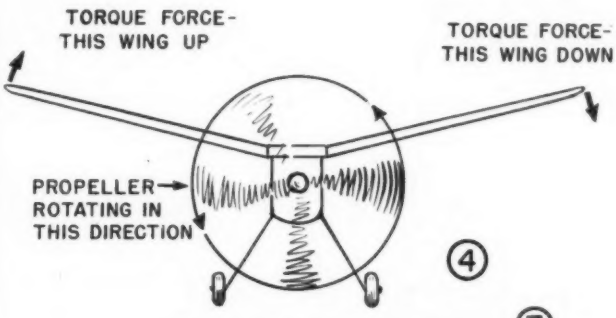
In the U. S. standard engines and props are right-handed. Torque tends to turn planes to the left and push left wings down. In Europe engines and props turn the opposite. Some twin-engined planes like the Lockheed P-38 used one left-hand and one right-hand prop to eliminate torque.

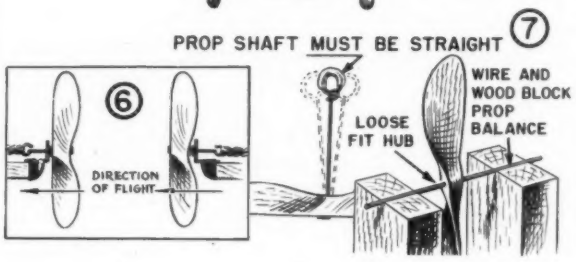
How do you know a right-hand from a left-hand prop? You can tell a right-handed prop this way:

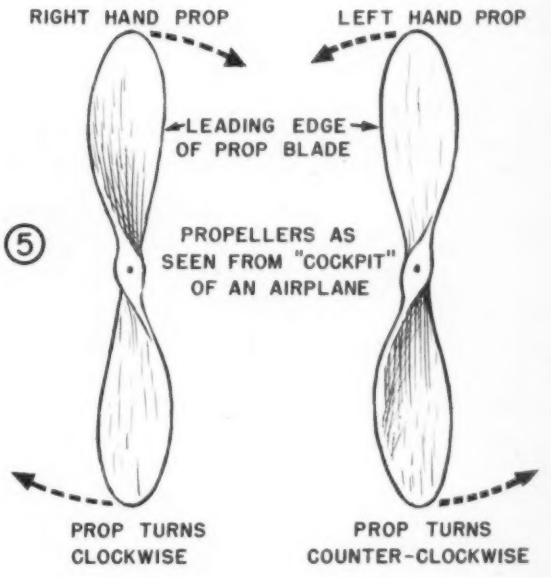
Hold it to get a full, flat view of it from the back (Figure 5) so the shaft points right at your nose. Now look at one blade. Since it is set into the hub at an angle, one

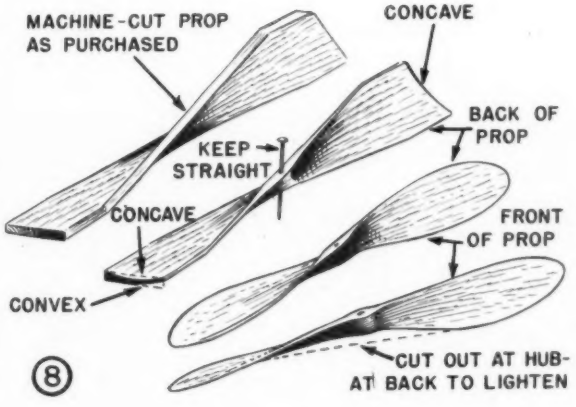


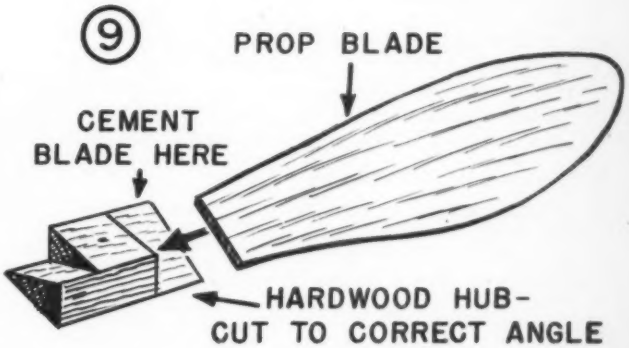












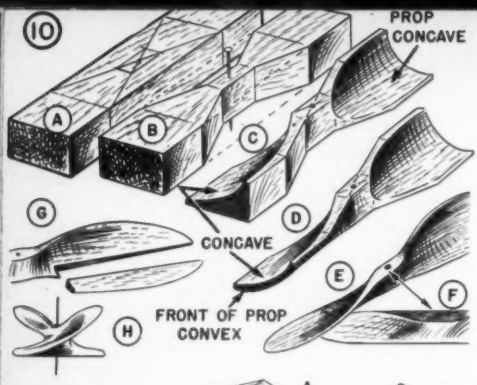
edge is actually farther from your eyes than the other. This is the leading edge.

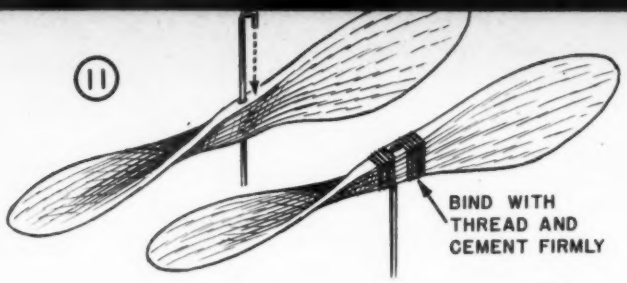
If this edge is on your right, the prop is "right-handed." It must turn clockwise. If the farthest edge from your eyes is on the left, it's a left-handed prop and must turn counter-clockwise.

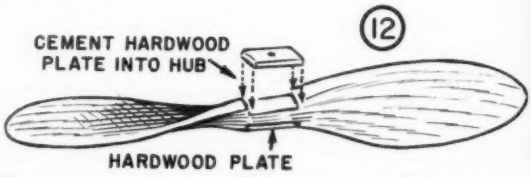
Pusher props usually are behind a main wing as in the B-36 bomber. They may be either right or left hand. The same prop used to pull a plane (called a tractor) may be used to push if it is spun the same direction. Left-hand props are sometimes used on light-plane pushers because the shaft of the engine is pointed toward the rear rather than toward the nose, resulting in the driveshaft revolving opposite to the direction it would if pointed ahead. (Figure 6).

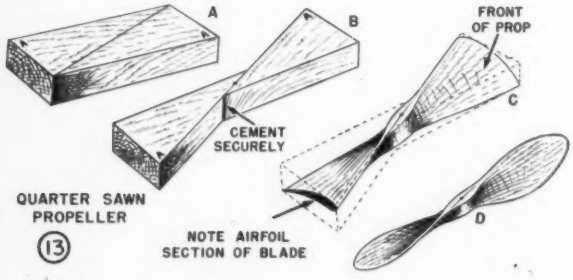
Now here are a few hints:

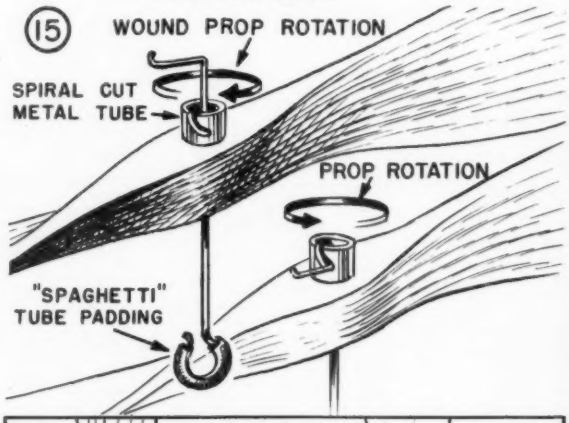
Wind up a prop (rubber motor) the opposite way it spins. Put shaft in center by sighting a straight pin or wire from the tip end of the prop to be sure it is a straight up-and-down (Figure 7) (*Continued on Next Page*)

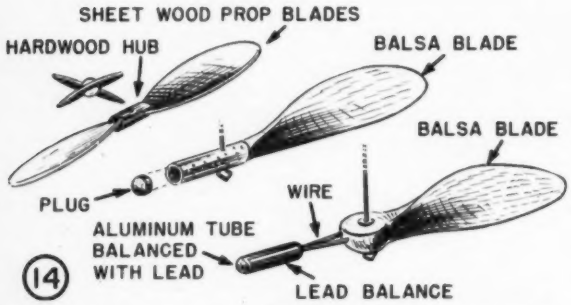


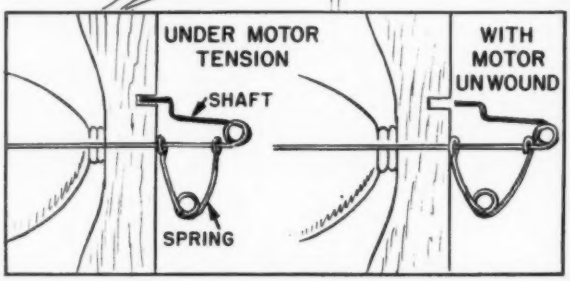


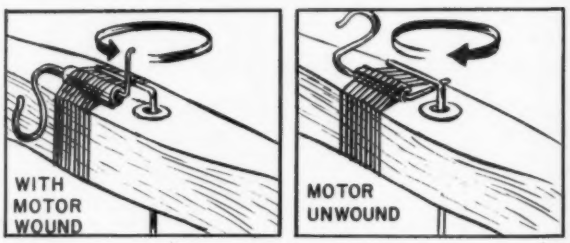


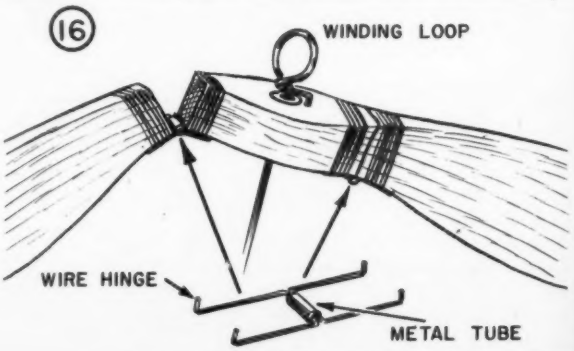












through the middle of the "X" formed by the blades. Sight it from the side too.

Shafts put through "off center" or at an angle to the hub cause unequal blade angle and off-balance props. This spoils the pull or thrust of prop. Turn prop over on pin or wire and check from side view for "wobble," which means prop is not "tracking." (One blade following exactly behind the other.) Check length of blade from center pin to tip for exact balance to stop vibrations. Balance prop by sanding after blades are equal length.

Front of prop blade is curved—convex like the front of a pair of spectacles. Rear of blade is "concave"—hollowed like a spoon—or flat.

Simple rule to remember for getting correct pitch and blade angle is: width of prop block (from which prop will be carved) is one-third more than thickness of block. In other words, the proportion between thickness and width should be 2 to 3. If block is ½" thick, for example, the width should be ¾". If block is ¾" thick, the width should be 1-1/8". (Arithmetic is important if you want to buil l airplanes.)

More width for the same thickness will give less blade angle and less pitch. This same idea applies to the small hub of a three-piece prop. Use it to check for the right pitch when making three-piece jobs as shown later.

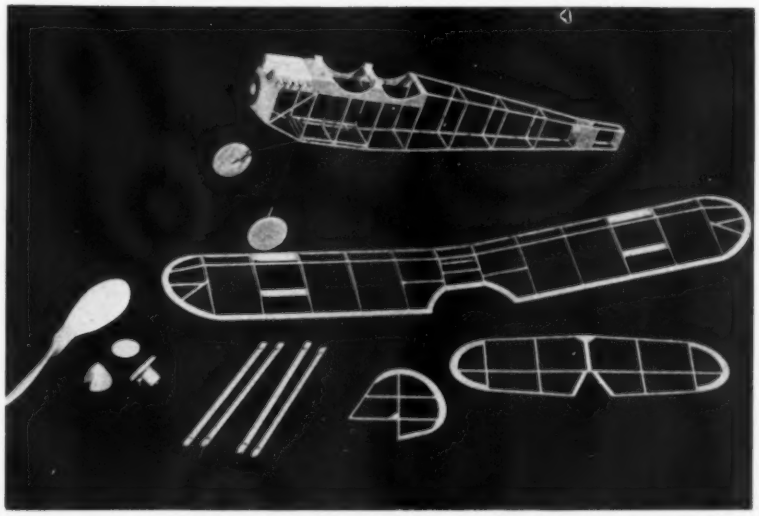
Diameter or length of props should be one-third of the plane's wing-span for rubber jobs made to fly. Special contest types use larger props.

KINDS OF PROPS

MACHINE CUT BALSA PROPS: Sandpaper, shape, trim, and balance them. (Figure 8). Then put shaft in place. If a small size (under (*Continued on page* 44)

Quickie Mail Plane

This IS a real flier, make no mistake! That free-wheeling propeller presents a fine opportunity to check up on Powell and Tracy!



Light, clean, simple—brother, this is building! You can pick up the dihedral details from this picture. Directions are detailed.

And you beginners! Make this job, fly it successfully, and you are on the way to being a hot-shot builder—as well as a master pilot!

by SHERMAN GILLESPIE

Crackerjack semi-scale model of old Ryan M-2 flies like a bird. Masterfully designed.

► The Ryan M-1 is a semi-scale model of the Hispano-powered Ryan of 1925. Built as a low-cost mail and passenger-carrying machine it proved efficient and dependable. Cruising speed was 105 m.p.h. and the pay load was 500 lbs. Top speed was 125 and it landed at 45 m.p.h. Service ceiling was 15,000 feet.

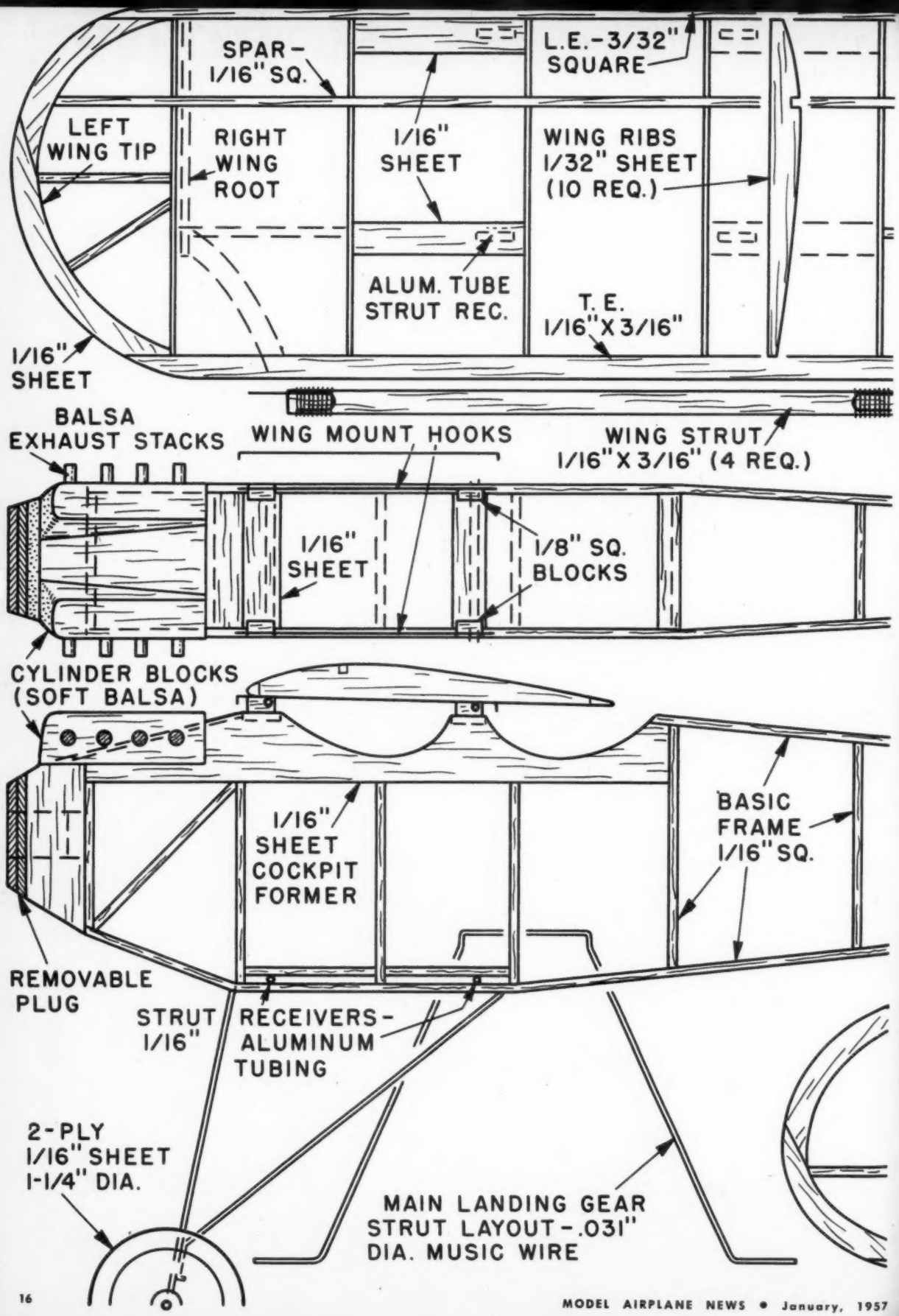
In 1926 and 1927 Wright "Whirlwind"-powered M-1's were flown on the 1000-mile Seattle-Los Angeles mail route by Pacific Air Transport. The Ryan Transatlantic Monoplane, Lindbergh's famous "Spirit of St. Louis," was developed from the M-1 design.

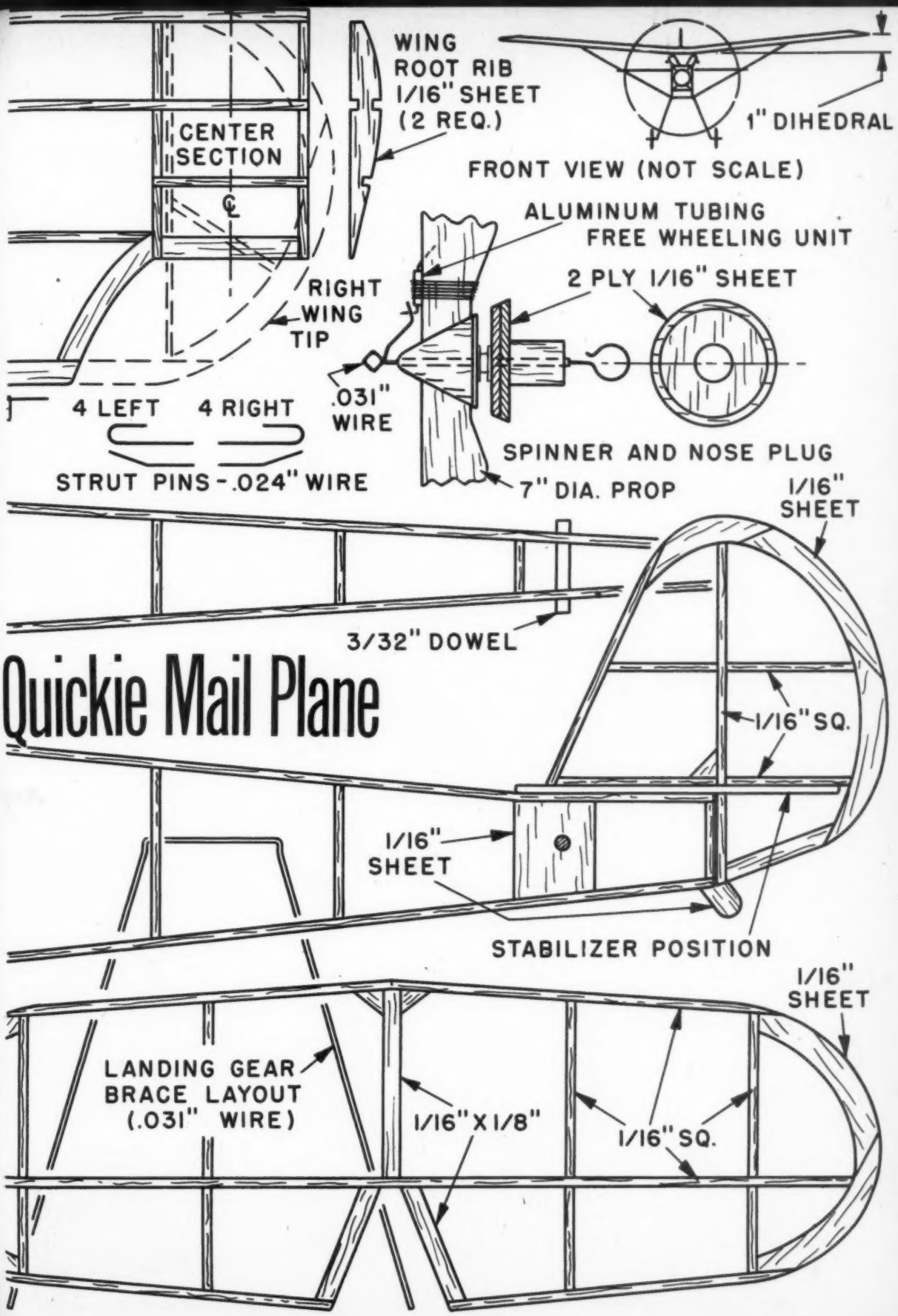
The model is a remarkable flier. Top flight times to date are 1:15, 1:19, and 2:09, handwound in warm air conditions. Study the plans, photos, and construction notes carefully. Complete flying weight should be approximately 1 oz.

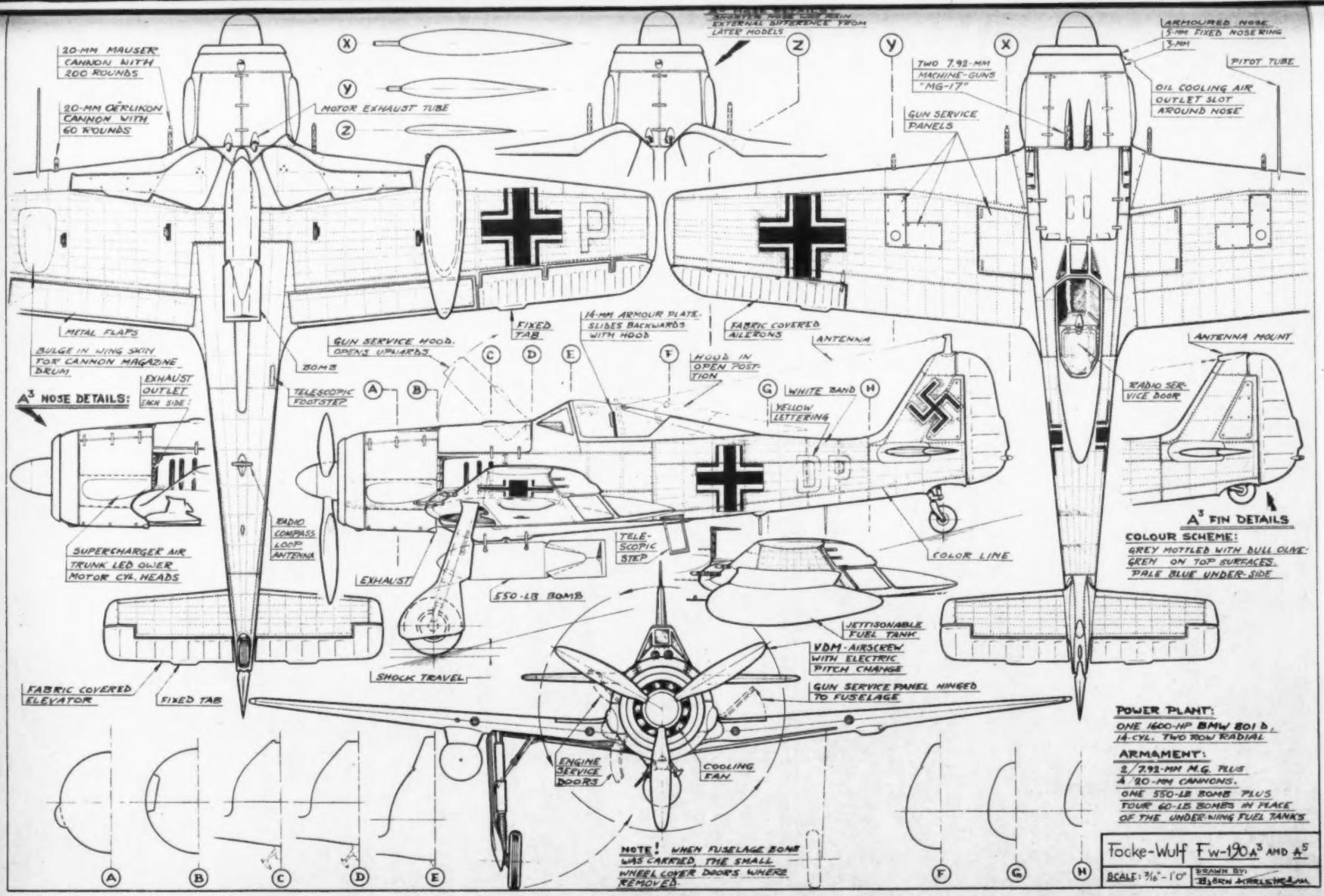
Build the fuselage sides from hard 1/16" square balsa. Set the completed fuselage sides up over the top view and put in the cross pieces. Install the 1/16" aluminum tube strut receivers. Cement on the ⅛" square wing mount blocks and put on the wing mount hooks.

Make the nose block from medium soft ½" stock. It forms down from a square to a circle. Drill it for the removable plug and cement in place. Use soft balsa for the cylinder blocks. Trim the underside so the blocks will tip out slightly to form the "vee." Use 1/32" sheet balsa for the fill between the blocks. Cut the eight exhaust stacks to size. Cement in place before color doping. Though the nose section is reduced to (*Continued on page* 52)

PLANS ON NEXT TWO PAGES

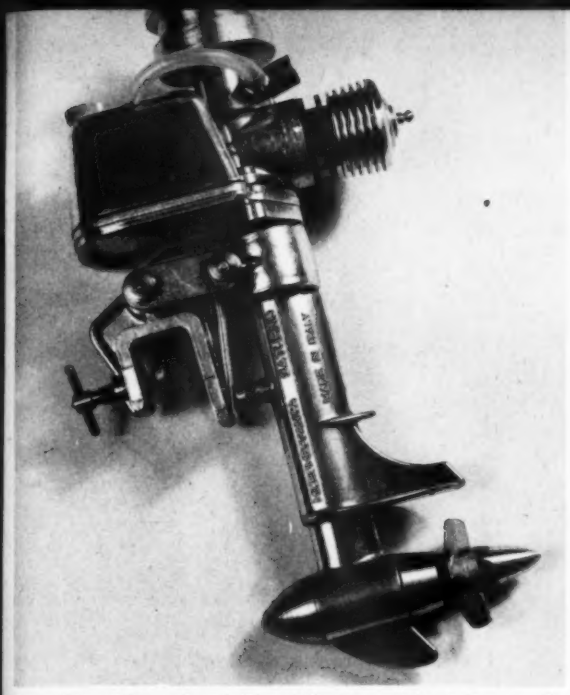

SPAR - 1/16" SQ.
L.E. - 3/32" SQUARE
LEFT WING TIP
RIGHT WING ROOT
1/16" SHEET
WING RIBS 1/32" SHEET (10 REQ.)
ALUM. TUBE STRUT REC.
T. E. 1/16" X 3/16"
1/16" SHEET
BALSA EXHAUST STACKS
WING MOUNT HOOKS
WING STRUT 1/16" X 3/16" (4 REQ.)
1/16" SHEET
1/8" SQ. BLOCKS
CYLINDER BLOCKS (SOFT BALSA)
1/16" SHEET COCKPIT FORMER
BASIC FRAME 1/16" SQ.
REMOVABLE PLUG
STRUT 1/16"
RECEIVERS - ALUMINUM TUBING
2-PLY 1/16" SHEET 1-1/4" DIA.
MAIN LANDING GEAR STRUT LAYOUT - .031" DIA. MUSIC WIRE


WING
ROOT RIB
1/16" SHEET
(2 REQ.)
CENTER
SECTION
℄
1" DIHEDRAL
FRONT VIEW (NOT SCALE)
ALUMINUM TUBING
FREE WHEELING UNIT
2 PLY 1/16" SHEET
RIGHT
WING
TIP
.031"
WIRE
4 LEFT
4 RIGHT
STRUT PINS - .024" WIRE
SPINNER AND NOSE PLUG
7" DIA. PROP
1/16"
SHEET
3/32" DOWEL
Quickie Mail Plane
1/16" SQ.
1/16"
SHEET
STABILIZER POSITION
1/16"
SHEET
LANDING GEAR
BRACE LAYOUT
(.031" WIRE)
1/16" X 1/8"
1/16" SQ.

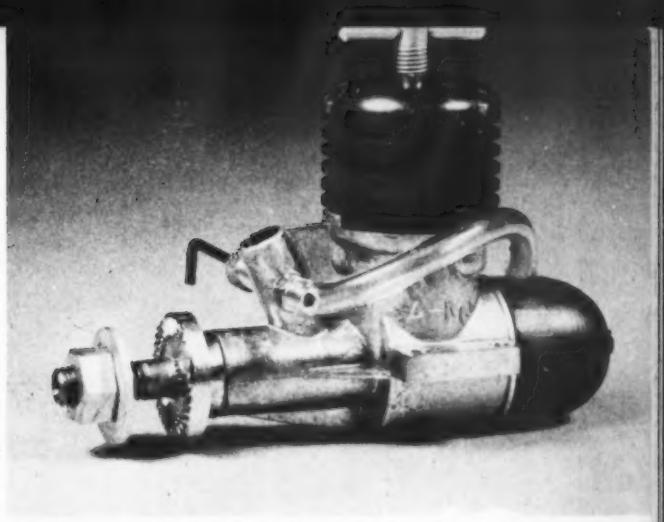


Planes Worth Modeling— FOCKE-WULF 190


EXTERNAL DIFFERENCE FROM
LATER MODELS
ARMOURED NOSE
5 MM FIXED NOSE RING



Super-Tigre G.29 outboard from Italy is an .049. Built ruggedly.



On hp per cu. in. basis British Allen Mercury 10 is small bomb.

Import Review

by P. G. F. CHINN

Another round-up of the latest and most unusual foreign made engines. All the dope.

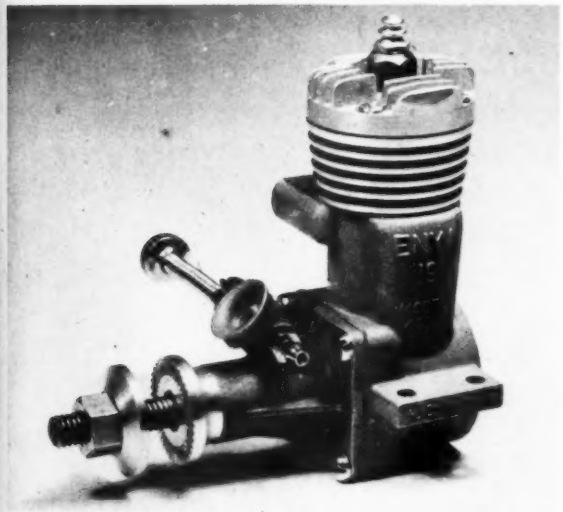
► This month we lead off with the Allen-Mercury '10' Diesel. The '10' stands for 1.0 c.c. displacement, equivalent to .061 cu.in.

This motor has created something of a sensation in Britain. Externally it looks just like any other Diesel. Strip it down and, aside from evidence of good workmanship, it still gives little indication that it will outperform any equivalent displacement motor yet built.

In terms of actual horsepower developed per cubic inch, the A-M 10 is on a par with the most powerful Diesels yet built. In its particular displacement group it stands head and shoulders above its competitors with 20% more power than its nearest rival and very nearly double the power of the most popular 1 c.c. engine in current use in Britain.

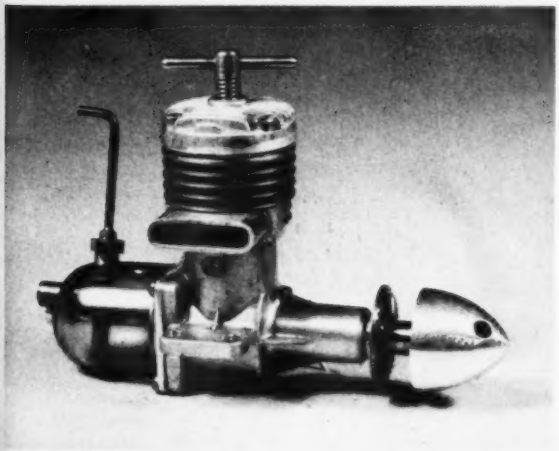
Like most Diesels, the A-M 10 has variable compression and is a radial ported shaft valve motor. It is for beam mounting only and comes equipped with fuel tank.

Most diesels are, of course, somewhat more heavily built than equivalent displace- (*Continued on page* 47)

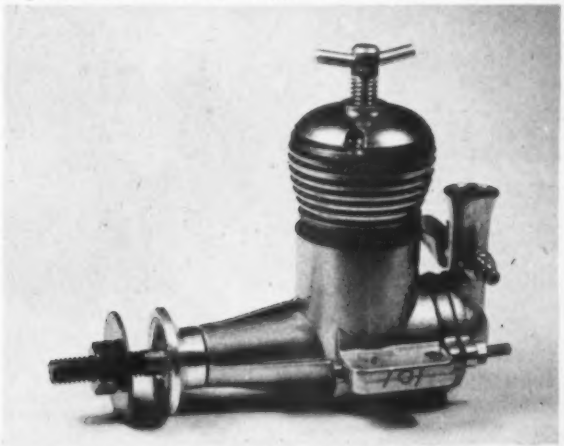


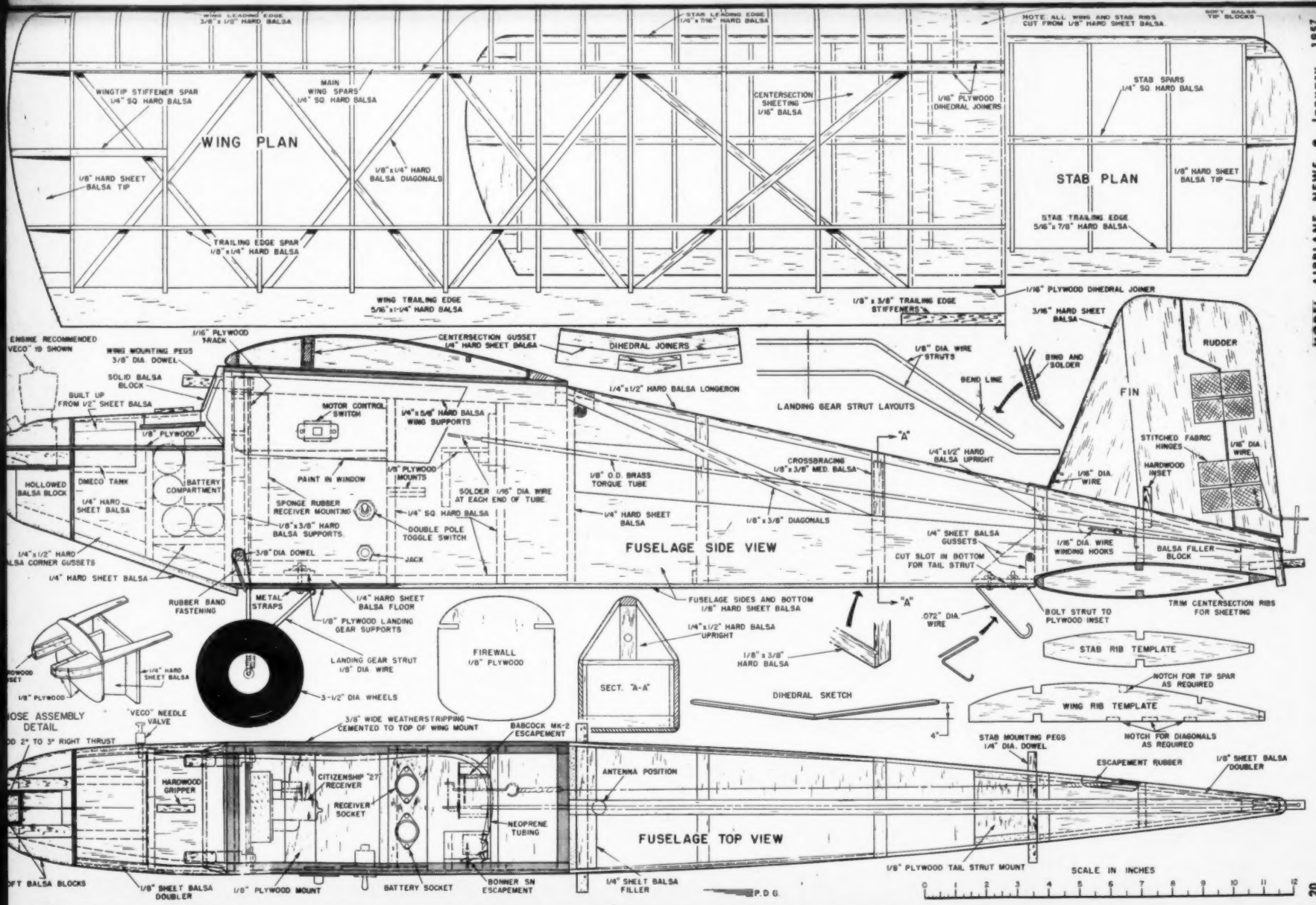
Hopped-up, Japanese Enya 19 features many recent improvements.

English ED Bee dates back eight years. 1957 version for beginner.

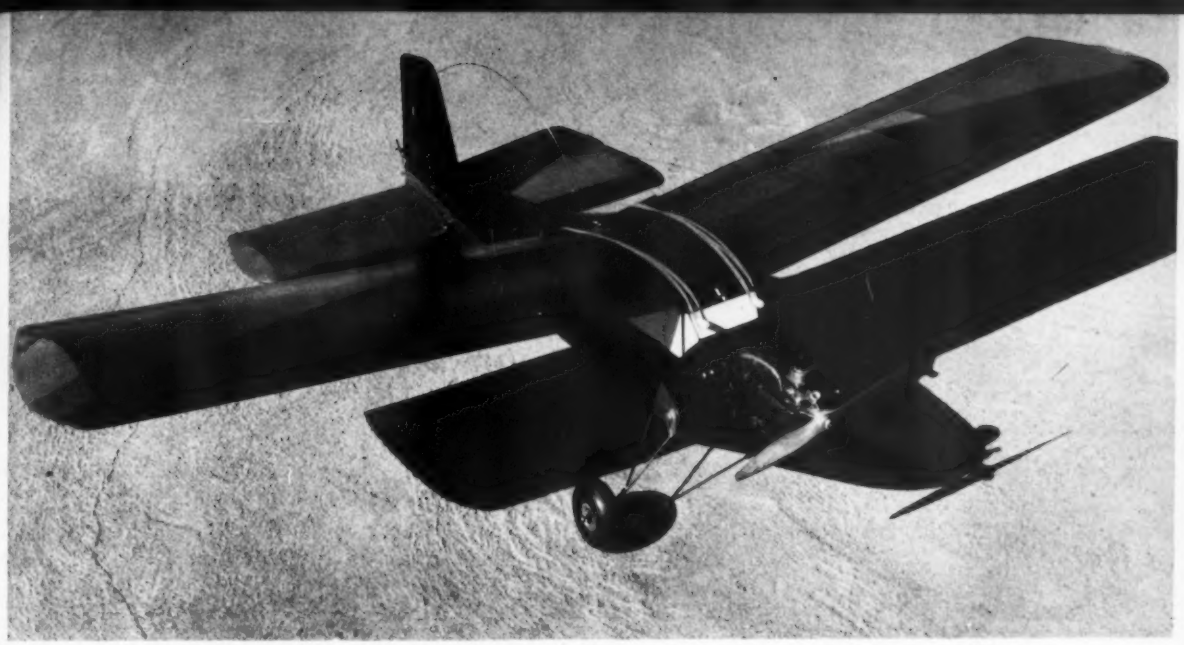


Frog 149 Diesel has unique clapper-valve. Engine is .09 cu. in.





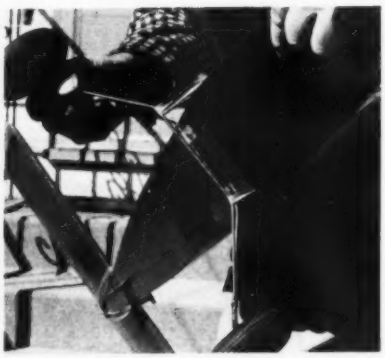
FULL SIZE PLANS AVAILABLE. SEE PAGE 56.



Functional, practical design minimizes fussing on the field and the irritating business of trying to get into inaccessible places.

GRAMPS

Knock off long, lazy hops with this practical RC ship for 19's. Excellent for beginners—or jangled nerves.



Two metal strap fittings pivot rear gear V. Rubber shock cords over dowels to front V.

► This is a pleasant-to-fly, easy to-build rudder airplane built for .19 power. It is an ideal sport job for anyone who finds the .09 planes too small or too underpowered for his taste. Because of its many very high, leisurely flights, the ship was dubbed "Gramps." Originally constructed as a test vehicle for advertised radio equipment, Gramps proved itself a machine worth reader attention. It has flown without difficulty, including landing nearby, in a 25 mph wind with gusts to 35 mph.

During the winter of 1955-56, an .09 Rebel was constructed to test various two-tube receivers. About that time vagaries in the gas tubes themselves led to substitution of a hard-tube receiver, which happened to be the Citizen-Ship kit, as shown in pictures last month. The Rebel proved to have noteworthy characteristics. For one thing, the upslanted, flat-bottomed nose, minimized broken props, the cost of which is the busy flier's biggest expense, more so than batteries. The combination of a Lorenz MOPA transmitter (supplied for the tests by Essco) and the receiver led to high flights during which the transmitter was shut off and the plane allowed to soar. Eventually, the Rebel was adjusted a bit like a free flight, with left on power, and right in the glide, for thermal riding. Then bigger batteries became desirable.

A very approximate scale-up of the Rebel was (*Continued on page* 57)

Rebel ancestry here apparent. Wing should be strapped on with several long rubber loops. So you use one loop—what if it breaks?

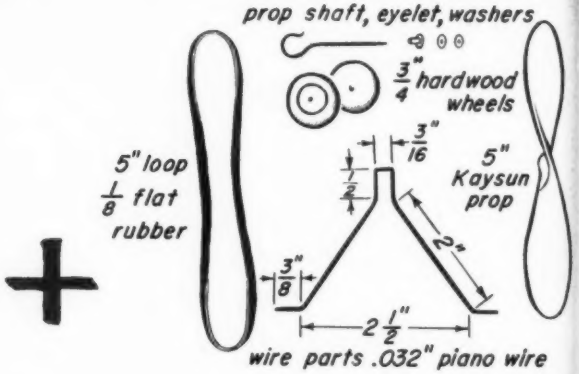
Nothing like an upright engine for easy starting and trouble-free, cool running. Ship is big enough to carry any radio, batteries.

Powered Glider

Take a balsa glider, rubber-model plastic prop, and presto, you've got a powered model. Watch carefully—

by Tom Henebry

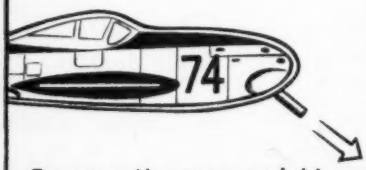
A ten cent glider.....



plus.....

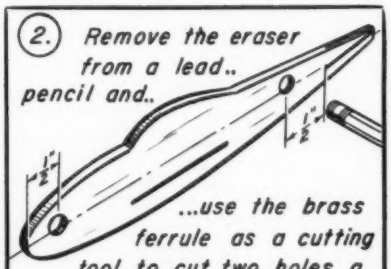
the above items and a few minutes work, will produce a fine little rubber powered flyer.

1. Disassemble the glider.



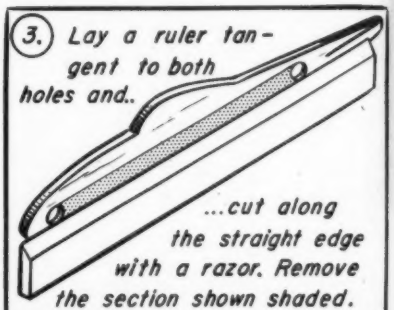
Remove the nose weight and replace with a balsa plug.

2. Remove the eraser from a lead pencil and...



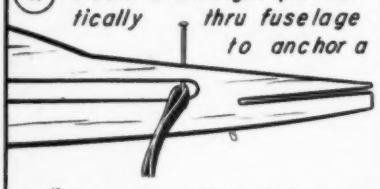
...use the brass ferrule as a cutting tool to cut two holes a little above the ℄ as shown.

3. Lay a ruler tangent to both holes and...



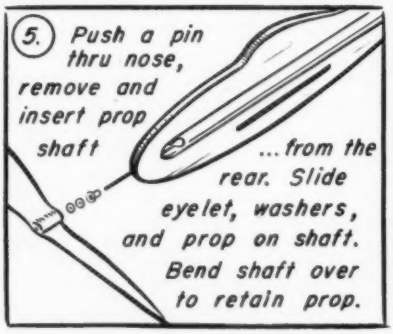
...cut along the straight edge with a razor. Remove the section shown shaded.

4. Push a straight pin vertically thru fuselage to anchor a



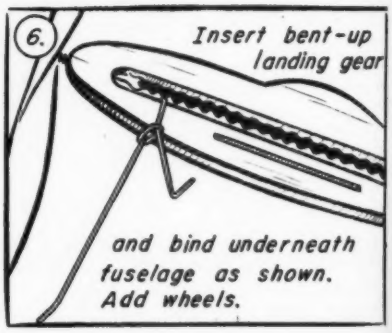
5" loop of rubber at the rear. Cut off part of pin that protrudes.

5. Push a pin thru nose, remove and insert prop shaft



...from the rear. Slide eyelet, washers, and prop on shaft. Bend shaft over to retain prop.

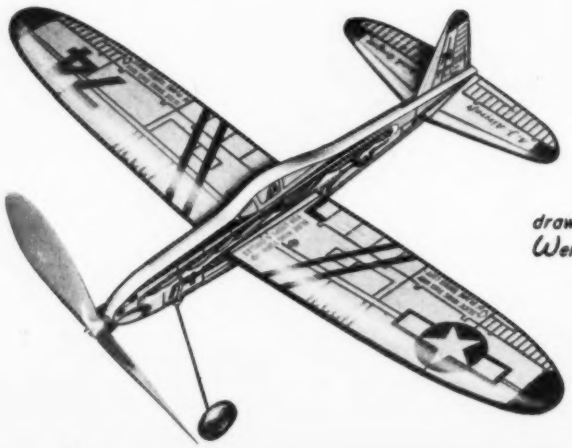
6. Insert bent-up landing gear



and bind underneath fuselage as shown. Add wheels.

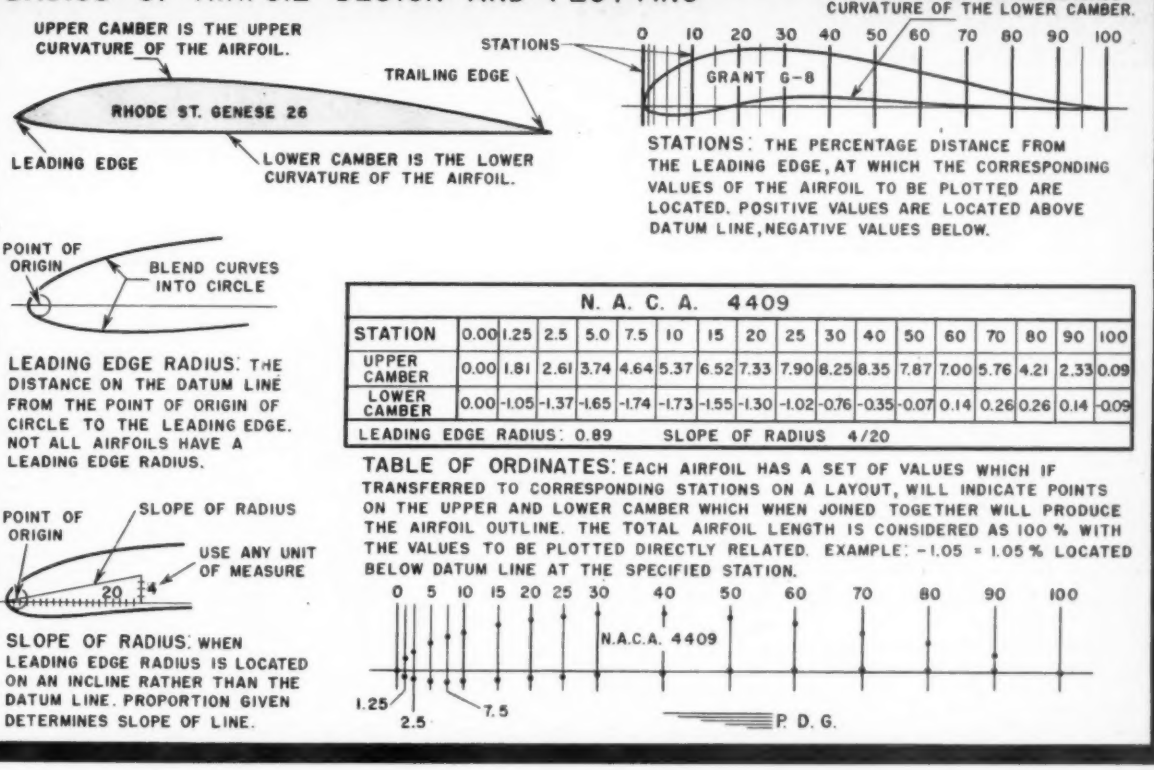
7. Hook the rubber loop over the prop hook, reassemble the model and you're ready to to fly. Same flying instructions as printed on original glider apply to powered version, so no difficulty in adjusting should be experienced.

.....and this is your finished model



drawn by.....
Wennerstrom

BASICS OF AIRFOIL DESIGN AND PLOTTING



N. A. C. A. 4409																	
STATION	0.00	1.25	2.5	5.0	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER CAMBER	0.00	1.81	2.61	3.74	4.64	5.37	6.52	7.33	7.90	8.25	8.35	7.87	7.00	5.76	4.21	2.33	0.09
LOWER CAMBER	0.00	-1.05	-1.37	-1.65	-1.74	-1.73	-1.55	-1.30	-1.02	-0.76	-0.35	-0.07	0.14	0.26	0.26	0.14	-0.09
LEADING EDGE RADIUS: 0.89							SLOPE OF RADIUS 4/20										

TABLE OF ORDINATES: EACH AIRFOIL HAS A SET OF VALUES WHICH IF TRANSFERRED TO CORRESPONDING STATIONS ON A LAYOUT, WILL INDICATE POINTS ON THE UPPER AND LOWER CAMBER WHICH WHEN JOINED TOGETHER WILL PRODUCE THE AIRFOIL OUTLINE. THE TOTAL AIRFOIL LENGTH IS CONSIDERED AS 100 % WITH THE VALUES TO BE PLOTTED DIRECTLY RELATED. EXAMPLE: -1.05 = 1.05 % LOCATED BELOW DATUM LINE AT THE SPECIFIED STATION.

by PAUL DEL GATTO

► For modelers, the study of airfoils is as intriguing as flying itself. To the rule-of-thumb balsa butcher, airfoils matter little, provided they are die-cut! Between these extreme views exist a fertile field for the hobbyist who looks for better performance from his airplanes. Most modelers know that airfoil selection is mighty important. Every type of model has its suitable airfoils, whereas the wrong airfoil will ruin its performance.

Most of us just "cut and try." This is a pretty fast method, but it's usefulness is limited to ROG's and sport models. For good results you must give considerable thought to airfoil selection. It may seem tedious at first to plot an airfoil, but with practice the procedure takes about 30 minutes. The airfoils shown here cover all phases of modeling. There are thousands of sections to choose from, but these are highly recommended.

Each has been used many times by the author and the recommendations are based upon the experience of various experts. For a delta or flying wing design, the experimenter should try the CLARK YH, NACA M-12 and the 2412. The NACA 2412 is proved in RC—also try the CLARK YH, or the NACA *(Continued on next page)*

From days of the Wrights, and before, experimenters, engineers, have pondered wing sections.

WHICH RIB?

The cross-section of flying surfaces has terrific affect on the way a model airplane flies. Wise up on airfoils!

M-12. For all around sport and good basic design few airfoils measure up to the CLARK Y; when in doubt use this section first.

The Davis airfoil is adaptable to many types of models. We recommend it highly for contest gas free-flight, rapid climbing rubber-powered models, high-aspect-ratio speed models, team racers and even for sport RC designs. If you have not tried these sections, give them a whirl. What you are using might prove best; but only by such comparison will you ever find out.

Marvelous wind tunnels, and ingenious testing methods have been devoted to the study of airfoils. Government laboratories and aircraft companies have spent millions of man hours learning the answers in this fascinating field—and their work is never done. Some of the results of their labors fortunately are available to the public. By writing the Superintendent of Documents, Washington, D. C., it is possible to obtain a price list of NACA reports, which include a number of comprehensive reports that show many dozens of airfoils, with their ordinates, and performance and characteristics plotted upon graphs.

Using this material, the modeler can find out such things as the lift and drag coefficients—relative indications in themselves for comparing sections, the ratio of lift to drag, the location of the center of pressure. All these things, and others, are revealed at every degree of angle of attack.

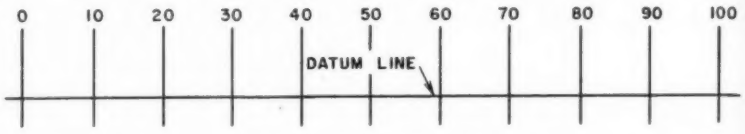
Unfortunately for modelers, airfoils do not always behave precisely the same on a model as they would on a real plane. Airspeed and the size of the rib test section greatly effect results and, since airfoil tests almost always have been made exclusively for the benefit of the full-scale designer, it is up to the modeler to bridge the gaps the best he can. The advanced reader will recognize the term Reynolds Number, but the descriptive term Scale Effect serves us well enough here.

Helpful to the modeler is the fact that some airfoils do behave about the way they should on miniature aircraft. And this is why some full scale airfoils have proved their advantages on various types of models—witness the selection on the right hand page.

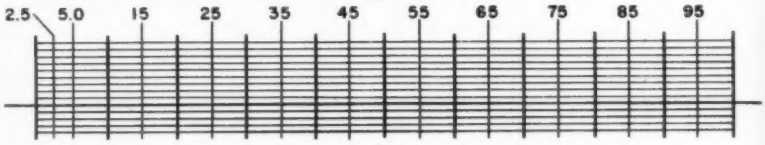
Flying speed, hence weight, may make two models differ from another in flight, though identical in every other respect. Theoretically, high aspect ratios are efficient but when the wing chord is narrow, especially on smaller models, theory may appear to take a beating. And then, too, airfoil thickness should tie-in with the plane design, not thick on a clean ship, or thin on a slow ship. These are the things that make the hobby attractive for the curious minded. Airfoils make a difference, that is for sure.

PLOTTING AN AIRFOIL (USING DIVISIBLE LENGTHS)

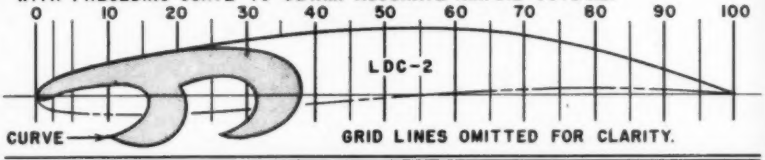
STEP ONE: SUBDIVIDE AIRFOIL LENGTH INTO TEN MAIN STATIONS, AND IF POSSIBLE USE A LENGTH WHERE ONE PERCENT WILL BE EQUIVALENT TO SOME UNIT OF MEASURE ON AN ENGINEER'S OR ARCHITECT'S SCALE. EXAMPLES: 1/16" = 1% ; 5/8" = 10%; 6-1/4" = 100% __ 3/32" = 1%; 15/16" = 10%; 9-3/8" = 100% 1/20" = 1%; 1/2" = 10%; 5" = 100% ___ 1/10" = 1%; 1" = 10%; 10" = 100%



STEP TWO: LOCATE REMAINING STATION POINTS AND DRAW GRID LINES PARALLEL TO, ABOVE AND BELOW DATUM LINE, AND SPACED APART 1%-2% OF THE AIRFOIL LENGTH, TO SIMPLIFY PLOTTING.

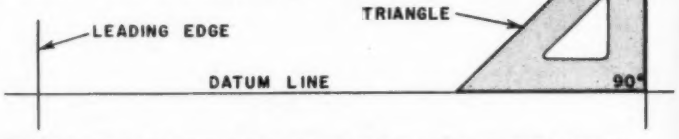


STEP THREE: LOCATE VALUES FOR UPPER AND LOWER CAMBER AT DESIGNATED STATIONS AND CONNECT THE PLOTTED POINTS. SELECT CURVES THAT WILL CONNECT WITH AT LEAST FOUR STATIONS AND BLEND SMOOTHLY WITH PRECEDING CURVE TO OBTAIN ACCURATE AIRFOIL OUTLINE.

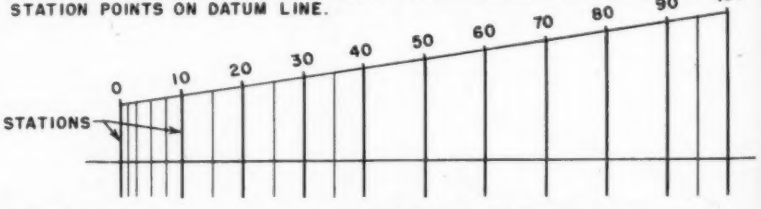


ALTERNATE METHOD OF PLOTTING {FOR NON-DIVISIBLE LENGTHS}

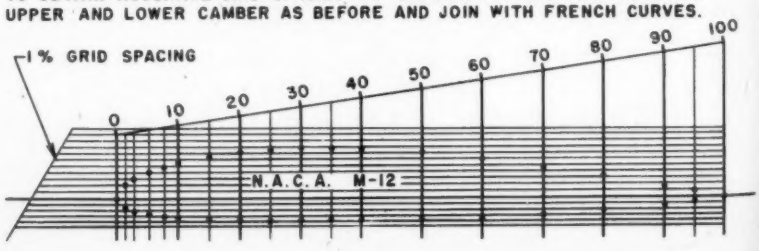
STEP ONE: MARK OF DESIRED LENGTH AND DRAW DATUM LINE. USING A TRIANGLE, ERECT A PERPENDICULAR LINE AT THE TRAILING EDGE.

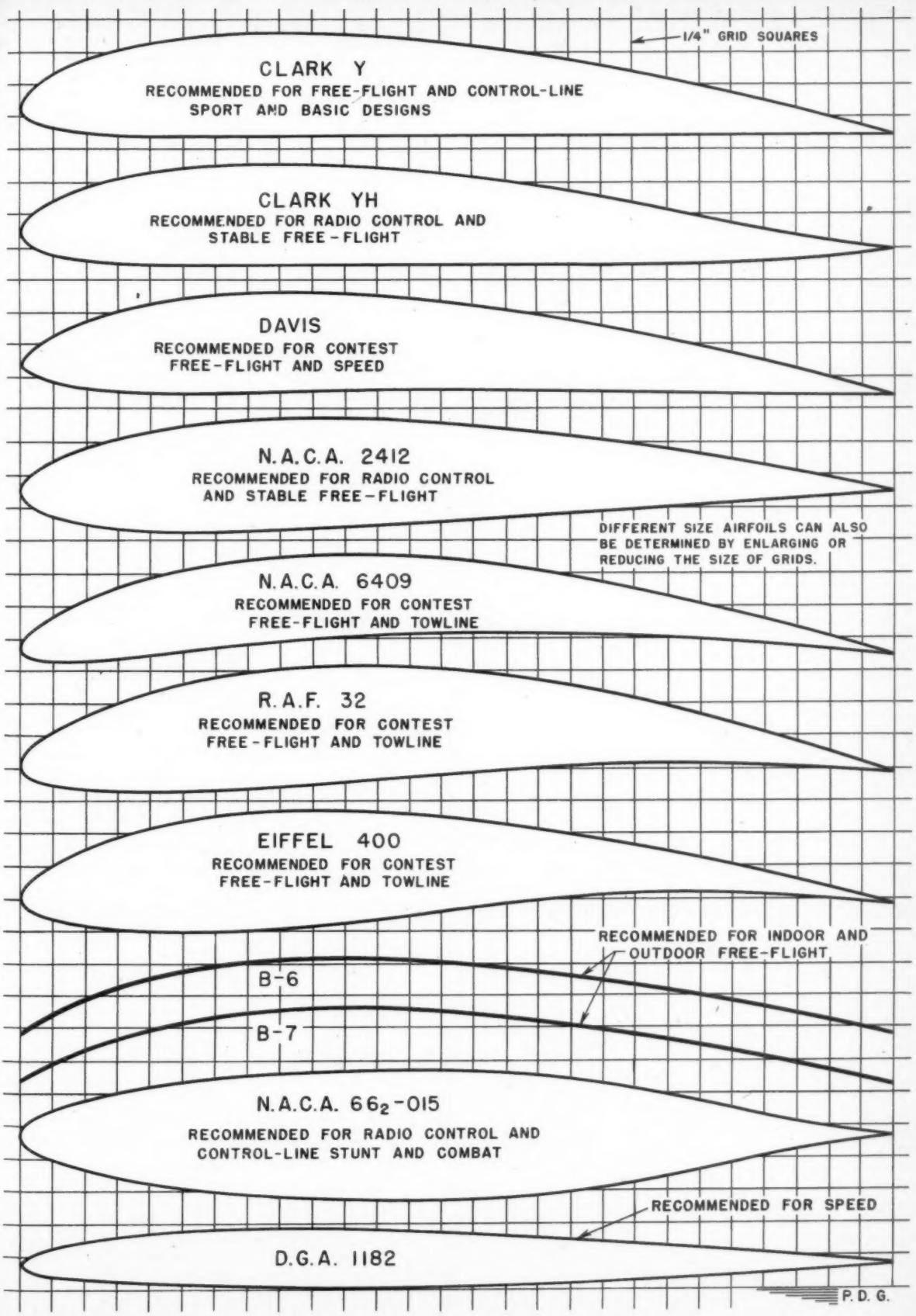


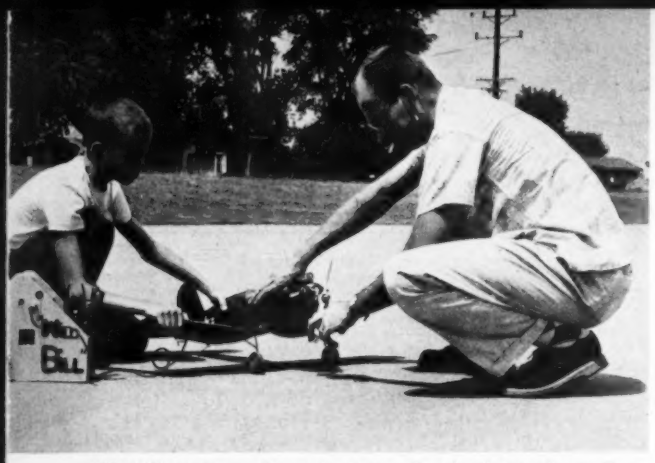
STEP TWO: DRAW LINE FROM POINT ABOVE DATUM LINE AT THE LEADING EDGE TO PERPENDICULAR LINE AT TRAILING EDGE, USING WHATEVER ANGLE PROVES SATISFACTORY FOR OBTAINING A LENGTH OF LINE BETWEEN THE POINTS OF INTERSECTION WHICH CAN EASILY BE SUB-DIVIDED. THEN LOCATE STATIONS ON INCLINED LINE AND DROP PERPENDICULAR LINES TO OBTAIN STATION POINTS ON DATUM LINE.



STEP THREE: USING PROCEDURE DESCRIBED FOR OBTAINING STATIONS, PROJECT INCLINED LINE FROM POINT ABOVE LEADING EDGE TO DATUM LINE TO OBTAIN ACCURATE GRID SPACING 1%-2% APART. LOCATE VALUES FOR UPPER AND LOWER CAMBER AS BEFORE AND JOIN WITH FRENCH CURVES.




1/4" GRID SQUARES
CLARK Y
RECOMMENDED FOR FREE-FLIGHT AND CONTROL-LINE SPORT AND BASIC DESIGNS
CLARK YH
RECOMMENDED FOR RADIO CONTROL AND STABLE FREE-FLIGHT
DAVIS
RECOMMENDED FOR CONTEST FREE-FLIGHT AND SPEED
N.A.C.A. 2412
RECOMMENDED FOR RADIO CONTROL AND STABLE FREE-FLIGHT
DIFFERENT SIZE AIRFOILS CAN ALSO BE DETERMINED BY ENLARGING OR REDUCING THE SIZE OF GRIDS.
N.A.C.A. 6409
RECOMMENDED FOR CONTEST FREE-FLIGHT AND TOWLINE
R.A.F. 32
RECOMMENDED FOR CONTEST FREE-FLIGHT AND TOWLINE
EIFFEL 400
RECOMMENDED FOR CONTEST FREE-FLIGHT AND TOWLINE
RECOMMENDED FOR INDOOR AND OUTDOOR FREE-FLIGHT
B-6
B-7
N.A.C.A. 66$_2$-015
RECOMMENDED FOR RADIO CONTROL AND CONTROL-LINE STUNT AND COMBAT
RECOMMENDED FOR SPEED
D.G.A. 1182
P. D. G.



Wild Bill cranks up his scale Corsair for the Carrier Event. Earnest helper is learning the trade. And look at that smooth ground!

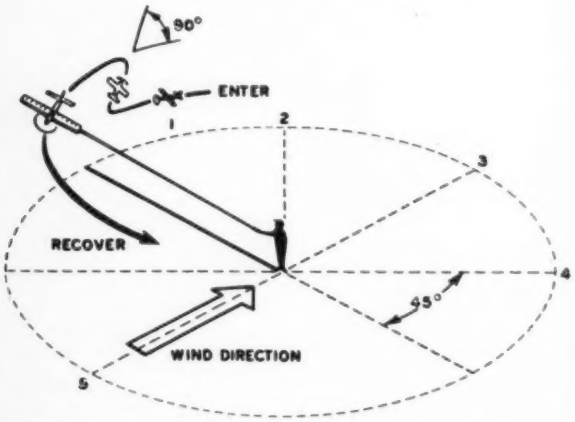
How to Fly STUNT

by W. F. NETZEBAND, JR.

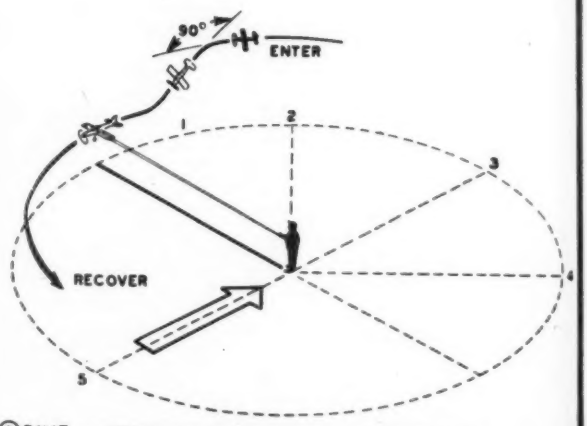
Both judge and competitor himself, a well-known flier tells how the stunt pattern really should be flown for maximum results.

NOW that we have checked out our ship, we are ready to fly the stunt pattern. It is important to notice that the event is called PRECISION Acrobatics. This gives us a clue to the type performance we are expected to make. Stunt is flown before judges who are familiar with the regulations and who are human. The author has spent much time in the hot seat too and extends greetings to fellow judges. You, who have never judged, don't sell them short. It's a tough job and largely a thankless one. Their job is to see how closely your pattern conforms to the limits set up in the AMA rules book.

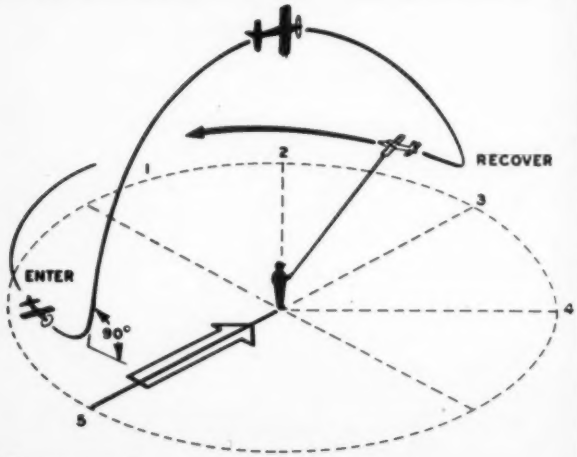
The author has found that a judge will unconsciously form an opinion of your style of flying which will affect decisions on close ones. No judge is going to give full points for a pattern during which the flier wanders all over between maneuvers or where our hero forgets to leave a level lap or two between maneuvers; simply be-



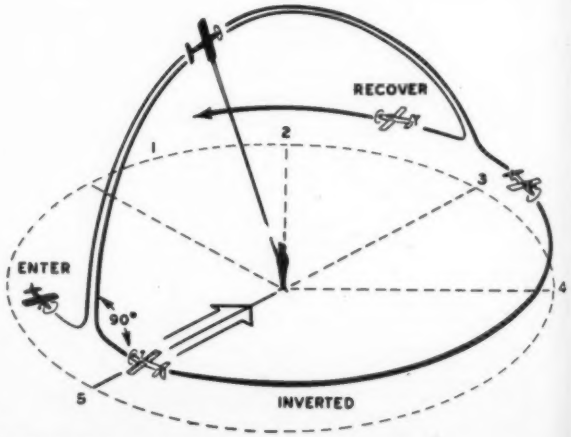
①CLIMB – VERTICALLY 20' MINIMUM, LINES 45° MAX.



②DIVE – VERTICALLY 20' MINIMUM, LINES 45° MAX.



③WING OVER – VERTICAL CLIMB AND DIVE.



④REVERSE WING OVER –

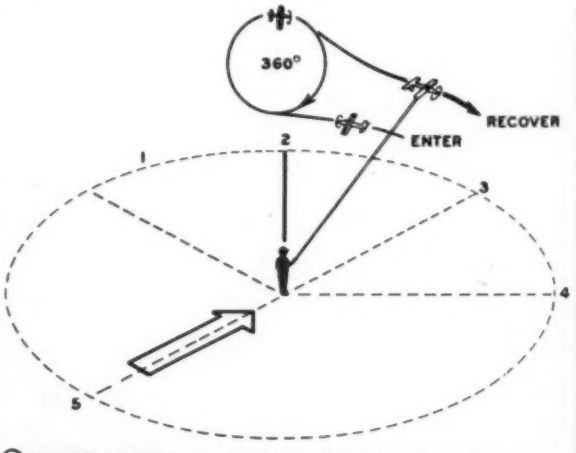
cause the judge cannot tell whether the flier is doing a maneuver or just messing around. So try this: After determining that your engine is running properly, signal for a full lap and then fly your two laps of level flight. In between maneuvers return to normal level flight altitude, except between climb and dive, and give him time to record your last maneuver. He'll appreciate it and you'll come out ahead. Make your entries into maneuvers positive and if you should mess up, do not try that one again, go on to the next. You will lose pattern points for attempting the same maneuver over. Learn the pattern, commit it to memory and when practicing go through it in order every time. Get used to the sequence.

To be more specific, let's go through some fine points. Wind is a nasty word to some fliers. It isn't nearly as frightening as it's cracked up to be. In fact the wind can be made to work for you, if you know how. The illustrations show five points on the circle relative to the wind direction. Also shown are the entry points for the various maneuvers. This is based on eight years of flying stunt. Select something which will indicate the wind direction such as a flag or pennant. Make sure you know where the wind is blowing from at all times; it shifts, you know. On your practice field you will probably find landmarks which you will use according to the prevailing wind. At a contest, the judges will usually place themselves on the upwind side of the circle, but they may place their backs to the sun, so don't use them for a wind sock til you've checked. Pick out your own reference point for various maneuvers before you fly and keep a sharp lookout for wind shifts. After you have flown your ship for a while it will become apparent how much it is affected by wind. Be consistent is good advice. You will find that through the astute use of wind you can fly a much heavier plane than in calm weather.

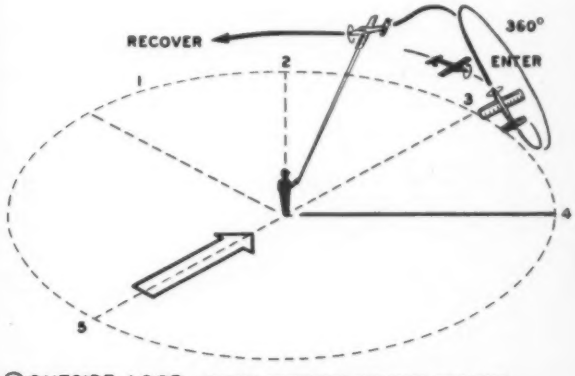
The author prefers a heavy plane for several reasons. A more sedate type of flight is achieved with less bouncing around from wind. Maneuvers can be flown through, as opposed to the "which way'd he go" of a high-speed job. More time for thought is allowed with this type and there is a better chance of getting out of trouble if a slip is made.

Most stunt men will recommend practice makes perfect. For the majority this is true. However, the author found that the more he practiced, after learning and getting used to the motions of the pattern, the worse he got. Some people cannot do routine things well. Repetition seems to louse them up. The Gold Brick's last eight flights were made at four contests, widely separated with no practice in between. We point this out merely to show that some of you will get worse if you practice constantly. If you get better with practice, then do it. The main thing is to get the motions

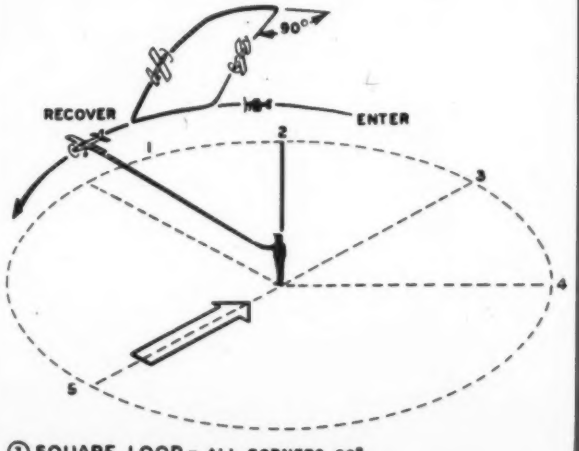
(Continued on next page)



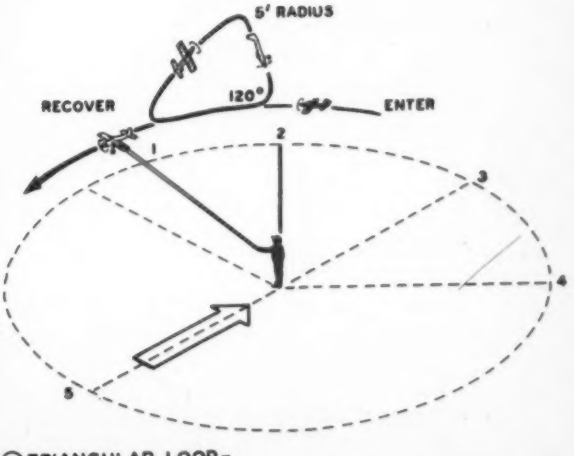
⑤ INSIDE LOOPS – ENTER UPRIGHT, RECOVER INVERTED



⑥ OUTSIDE LOOP – ENTER INVERTED RECOVER UPRIGHT



⑦ SQUARE LOOP – ALL CORNERS 90°



⑧ TRIANGULAR LOOP –

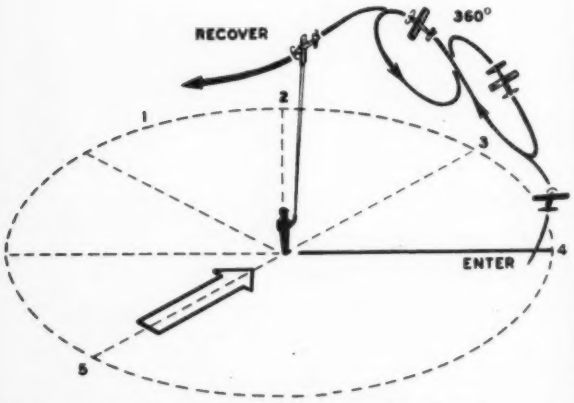
of the pattern down pat so you can concentrate on the details of terrain and wind.

To get back to the illustrations for a moment, these entry positions were selected for various reasons. You'll notice that the only time you will maneuver on the up-wind side is on the wingover. We start them up-wind to make it easier to fly a truly vertical line. Loops are done up-wind to prevent walking, or each successive loop moving forward. The eights are started directly down wind to give maximum tug and to aid in keeping them round. Study the rules carefully and make all entries as prescribed. If you make a mistake, go along like you knew what you were doing. A sharp judge will catch you anyhow, but sometimes you can get by with it. Grimacing or throwing a fit will call attention to it like a Bikini on Main Street.

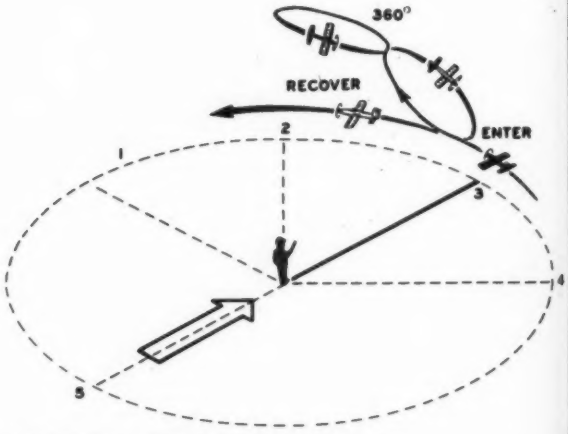
A simple trick to get a smooth pattern is to set your engine rich in level flight, just below the point where it runs 2 cycle. Then when you maneuver the ship your engine will peak out and compensate for the increase in drag. So your ship moves at roughly the same speed all the time. Peak the engine at the start and you are dead. Remember too, you have *three* attempts for two official flights. If you don't like your engine run, don't signal. We goofed in '55 with a lean run which could have been an attempt. I have one engine which hauls nothing but my stunt job. This way, I know exactly how it should sound for a good run. Changing around causes confusion. When you have finished your flight, clean up your ship and cover the engine. Stay away from the judges. They know what they are doing and you have done all you can in the circle. They can do a much better job if they aren't pestered by helpers, spectators and fliers crowding around and cutting off the air.

If you get a chance to fly in calm weather here are a few tricks to use if your ship isn't perfect. If it turns tightly enough but not too smoothly, do your round maneuvers coming into the judges. Then they can see the height of your loops but it's difficult to judge the smoothness. If the opposite is true, that is smooth but wide, do them right in front of our friends so they see the shape but not the size. Again these tricks won't work on all, but there are possibilities. Of course, it's better to have a good all round ship.

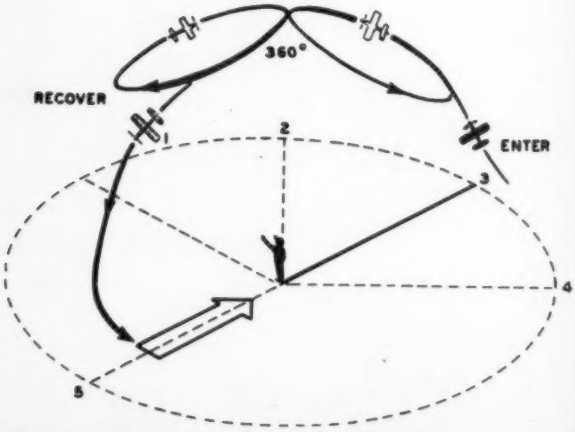
We will get into design later, but for the present most of you are probably flying kit jobs. How did you pick the one you bought? Color of box, wild claims, past performance, or what? It has become apparent to us over the years, that each person must find a ship that suits his personality. For instance: If you are naturally slow moving and methodical you will be ill matched with a red hot, sensitive bomb. Your natural pace will be disrupted and you will find yourself behind the ship most of the (*Continued on page* 54)



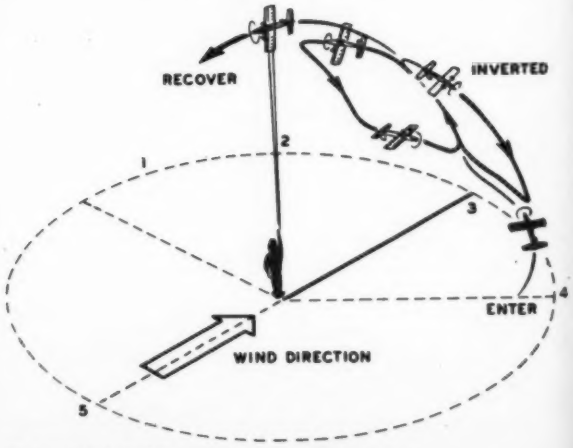
⑨ HORIZONTAL EIGHTS - ENTER AT 4 INTERSECT AT 3



⑩ VERTICAL EIGHTS - INTERSECT AT 3



⑪ OVERHEAD EIGHTS - INTERSECTION OVERHEAD



⑫ SQUARE EIGHT - ENTER & INTERSECT AT 3

Nelson Debardbelaben launches his big Custom Cavalier. Also takes off, flies realistically.

New Babcock 465, one- and two-channel r'cvrs.

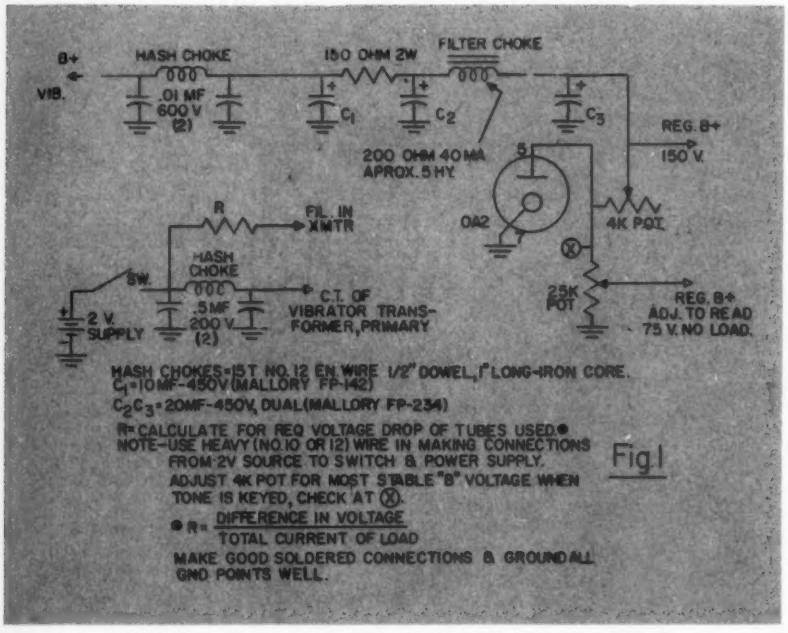
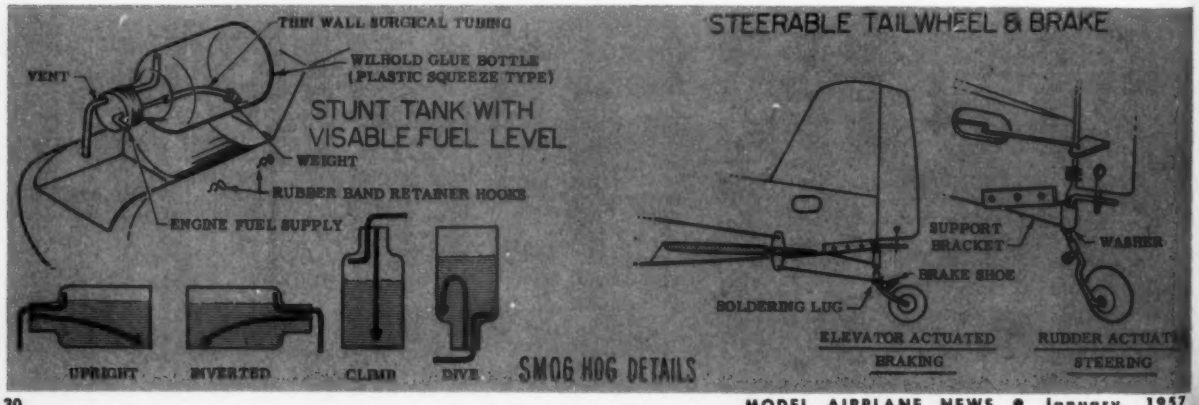


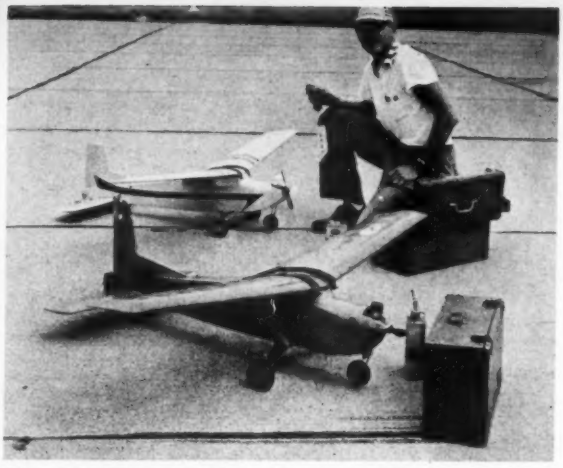
Fig. 1

Radio Control News

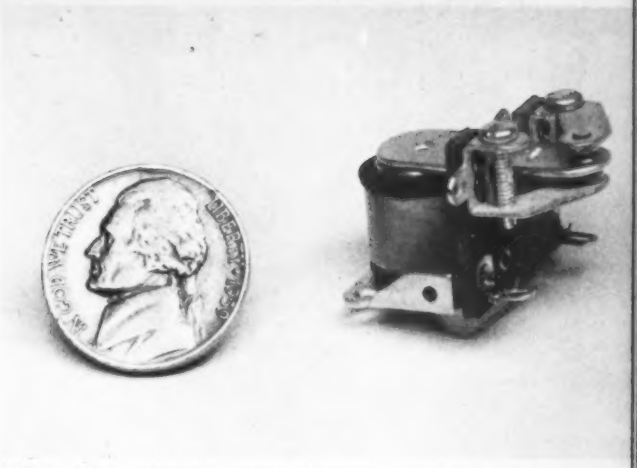
by E. J. LORENZ

Round-up of equipment for the newcomer • New items • What the experts are up to • Technical topics • All the news.





Original by Allen and Jackson, the Lancer. Robot syncro actuators.



Babcock relay, adjustable contacts, balanced armature, is small.

TECHNICAL TOPICS

► Many readers have requested information on the building of a vibrator type power supply for their transmitter. After reviewing a variety of circuits and checking on the prices of the components needed, we are going to recommend the unit marketed by Electronic Specialties, 58 Walker Street, N.Y.C. This vibrator supply will provide up to 40ma of current and voltages up to 180 volts. The kit contains quality parts at a price below what you would normally pay for individual items. It operates from a small 2v wet cell or from one cell of your car battery.

Going one step further, we have the circuit shown here, by Fred Mann, Sidney, N.Y. Mr. Mann developed this circuit in order to provide a stable voltage source for reed transmitters, since the stability of the audio frequency is of prime importance. The circuit uses a voltage regulator tube and can be tapped for a lower voltage, which is used to provide B supply for the audio section of the transmitter. This unit will be described next issue.

Construction of this power supply is fairly simple, as long as the schematic is followed in making your connections. If it is desired to operate a straight tone job, such as the Badaco or Babcock single-channel receiver, you can use a 15 to 25k resistor in series with the B-plus lead, hook it directly to the B supply and omit the VR tube and its associated components. With reed equipment on the upswing and more builders desiring to build their own equipment, you will get excellent service from this power supply and the audio unit to be presented. Gyro Electronics, 325 Canal Street, N.Y.C. also supplies a vibrator supply kit.

Last month this column began a review of RC equipment for the newcomer. A brief description was given of what is required and this month we'll cover simple single-channel equipment. Despite what you may hear to the contrary, it is highly recommended that the beginner start with a single-channel rudder-only type of control system.

First of all, for the RC fan who feels he is capable of assembling his own equipment, we'll review the typical kits for transmitters and receivers which are in general use. Receiver kits divide roughly into two classes: the two-tuber receiver, which uses a gas tube for the detector, and the single hard-tube receiver. Some kit manufacturers offer a twin hard-tube receiver. As a general rule, the present gas-tube receivers are the easiest to build and put into operation. They are limited by a relatively short tube life, although many users get up to two years of service from their gas tube. (Nor is the gas tube reliably standardized in performance—Editor)

The top hard-tube receiver kit, single tube and carrier operated, is the PR 27, manufactured by Citizen-Ship Corp., Indianapolis, Ind. This set uses a printed-wiring chassis for ease of assembly and reliable operation. It is by far the best buy in single hard-tube receivers. Complete with relay, the price is $19.95. The companion transmitter for this receiver is the FL 27, also selling for $19.95, complete with printed-wing chassis, crystal and tube. This receiver is used in Gramps, elsewhere is this issue.

Ace Radio Control of Higginsville, Mo., and Electronic Specialties, 58 Walker Street, N.Y.C., manufacture single hard-tube receiver kits of units which have appeared in various magazines. The quality of these kits and the manner in which the plans are presented make them easy to assemble, even for the novice. Single-tube transmitters may also be had from these companies, in addition to those sold by Gyro Electronics, 325 Canal St., N.Y.C., and Lafayette Radio, 100 Sixth Avenue, N.Y.C.

For those desiring a hard-tube receiver (longer tube life) which will work 'right out of the box', there is the Babcock BCR-3 receiver, (also Citizen-Ship PLR receiver, etc.). This equipment, in the hands of a novice, won first place in rudder-only at the 1955 Nationals. The receiver operates on a tone-modulated signal and the range is well in excess of that needed for flying a model. Operation is foolproof. The receiver costs $29.95 and the transmitter $39.95.

Another set which we feel is excellent is the model R-1 receiver and T-12 transmitter, manufactured by CG Electronics Corp., Albuquerque, New Mex. This equipment is tone actuated and, like the Babcock unit, is practically free of interference of the type which might affect carrier-operated receivers. The receiver and transmitter which sell for $26.95 and $31.95 respectively, are not available in kit form.

From Badaco Mfg. Co., 2801 Penick Avenue, Shreveport, La., comes a very neat and compact two-tube tone-actuated receiver. The receiver is completely encased, except for the tubes, and sells for $24.95, camplete with tubes and relay. The 80T transmitter is the companion to the model 180R receiver. This $34.95 transmitter will operate carrier-type receivers, tone-modulated receivers (100% modulated) and certain multi-channel receivers.

The latest tone equipment to hit the market is the Robot Line, manufactured by Valley Electronics, 729 Delano Avenue, Vastal, N.Y. The $29.95 receiver and $39.95 transmitter are sold only through the manufacturer. The receiver features a Sigma 26F relay, noted for its sensitivity and adpatability (*Continued on page* 40)

True story of a plane th
eleven months of Verm(t
rugged weather...in the p
why it lived to fly agai

"Vermont, as most people are aware, is not known for mild weather. The three of us free-flighting at Warren R. Austin Airport at Swanton one zero day in January of 1955 were trying to be pretty careful about timer settings, because it wasn't the time for any lost-model searching. But the timer on my Berkeley Super Brigadier wouldn't hold a setting because of the cold, so I by-passed it and tried to guess my engine run by pre-running it on the ground. On the first flight my guess was pretty bad; the model circled north over dense woods and went in a mile or more from us. One of the others — an old-time modeler — said we'd better find it in a hurry or there wouldn't be much left of it after a few days of Vermont winter had worked on it. So we fanned out and hunted, but with no success. During the next week, two of us tried again several times on snowshoes, but still all we saw was snow, trees, and the tracks of small wild animals. So the snow continued to fall and the spring rains came — and occasionally I'd think of the model, probably almost disintegrated by Vermont's rugged weather. Then in December it was found and returned to me, after having spent a little over eleven months in the open. I was thoroughly surprised to find that the glossy Testor's Butyrate Dope finish was not only completely undimmed, uncracked, and undamaged, but that it had done a really marvelous job of protecting the structural wood! Much of the wing had to be replaced, but only because it had been broken in the crash. The fuselage and tail, however, were practically as good as new; the tail surfaces weren't even warped! And even now, there's no apparent difference between the new finish on the wing (also Testor's Butyrate, of course), and the original finish on the fuselage and tail."

TESTORS

TESTOR CHEMICAL COMPANY • ROCKFORD, ILLINOI

EUROPEAN SALES OFFICE: STOCKHOLM — STOCKSUND, SWEDE

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ht's

e pen...and

ii

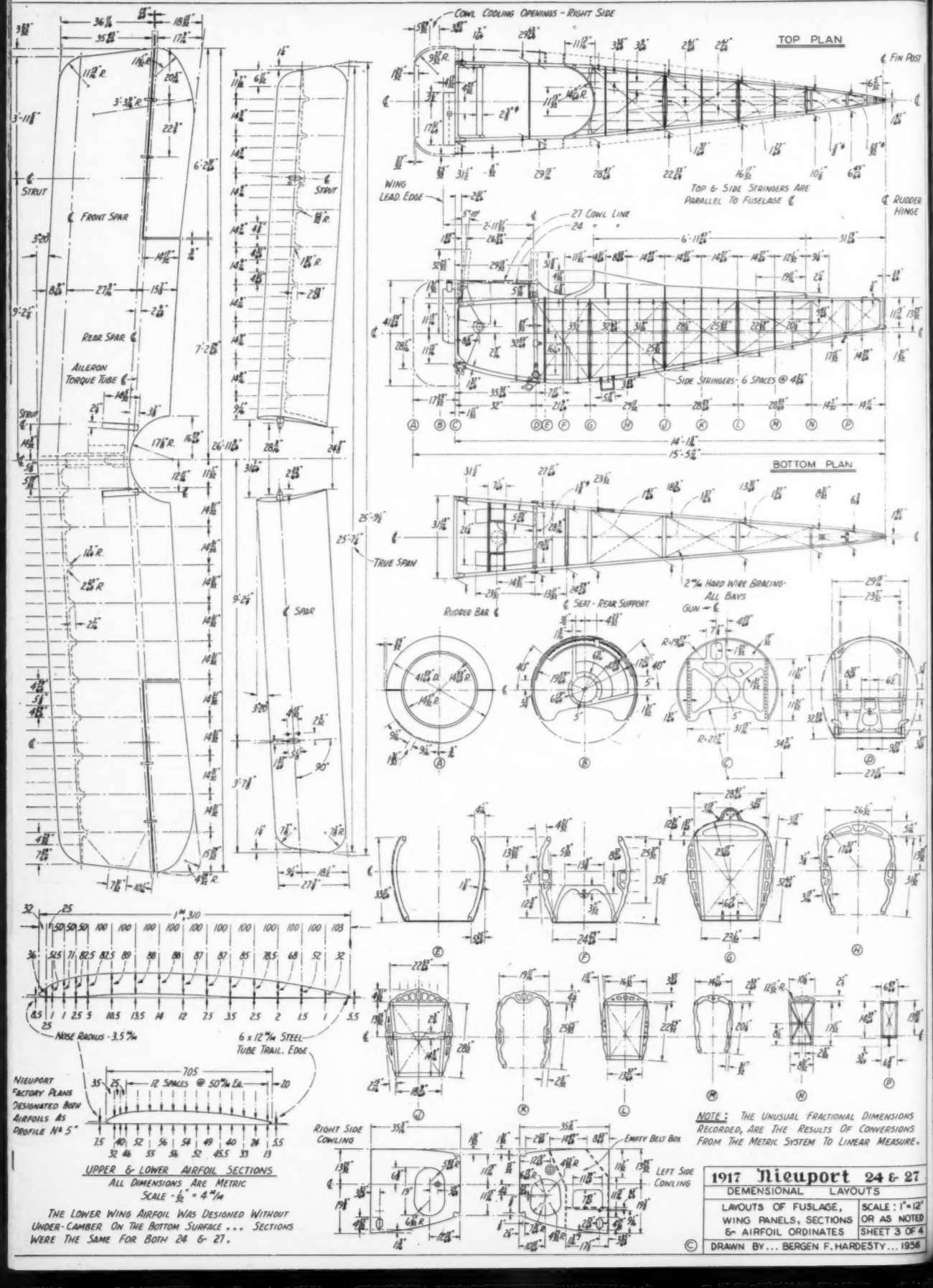
Read the details — exactly as reported by John Hart Macy, Bradford, Vermont, whose "Houn' Dog" and "Coon Dog" model designs have previously been publicized editorially in leading Model publications.

TESTORS

BUTYRATE DOPE

Has no equal for high hiding power, easy brushing or spraying, controlled shrinkage, excellent rubbing qualities, high flexibility, film toughness, pure color brilliance . . . *plus the added special feature of being* HOT FUEL PROOF, too!

NIEUPORTS 24 & 27—FRENCH FIGHTERS OF WORLD WAR 1.



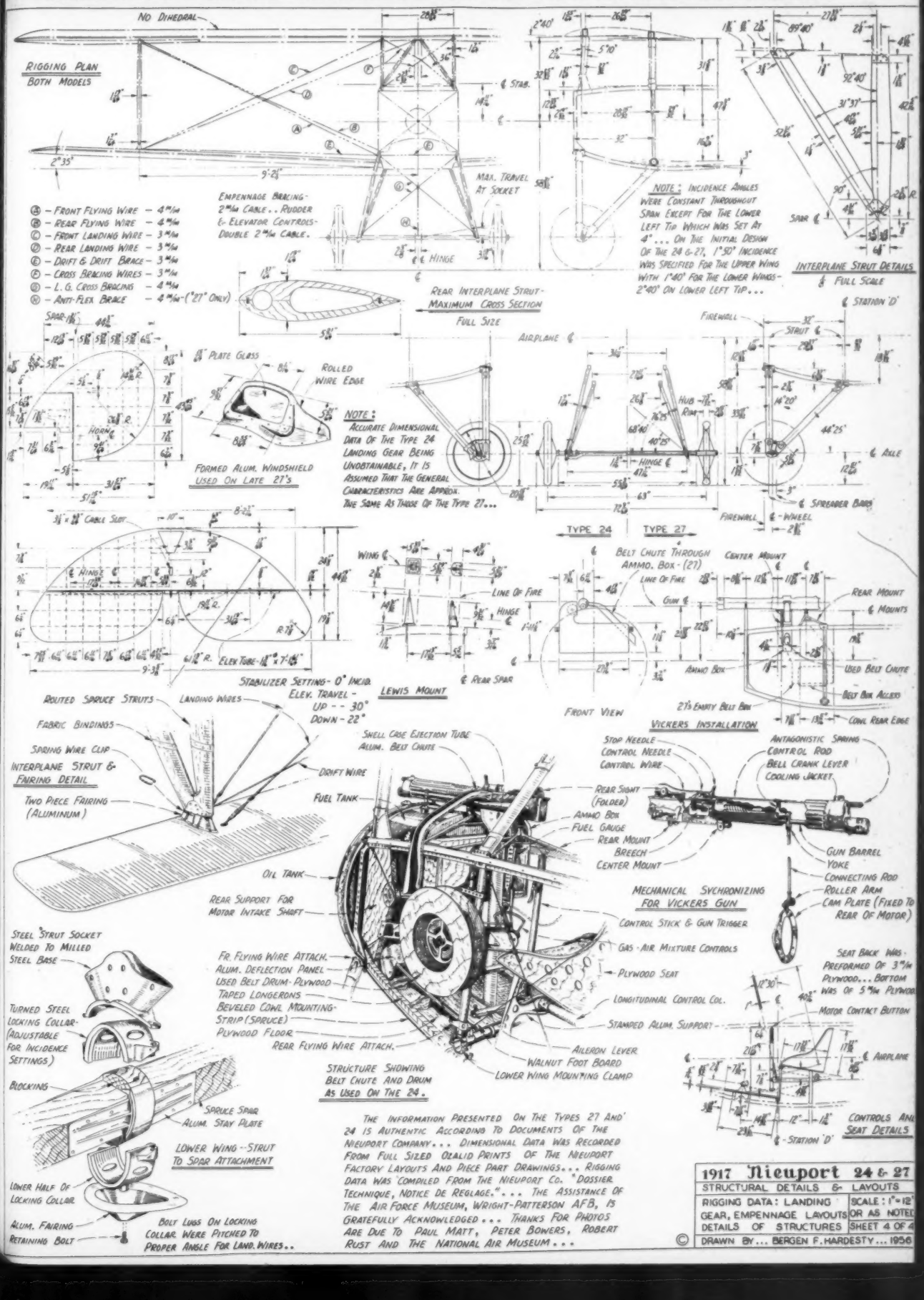
UPPER & LOWER AIRFOIL SECTIONS
All Dimensions Are Metric
Scale - ½" = 4"/m

The Lower Wing Airfoil Was Designed Without Under-Camber On The Bottom Surface ... Sections Were The Same For Both 24 & 27.

NOTE: The Unusual Fractional Dimensions Recorded, Are The Results Of Conversions From The Metric System To Linear Measure.

1917 Nieuport 24 & 27 DEMENSIONAL LAYOUTS	
LAYOUTS OF FUSLAGE, WING PANELS, SECTIONS & AIRFOIL ORDINATES	SCALE: 1"=12" OR AS NOTED
	SHEET 3 OF 4
DRAWN BY... BERGEN F. HARDESTY... 1956	

THESE TWO PLATES CONCLUDE A TWO-PART PRESENTATION.



THE INFORMATION PRESENTED ON THE TYPES 27 AND 24 IS AUTHENTIC ACCORDING TO DOCUMENTS OF THE NIEUPORT COMPANY... DIMENSIONAL DATA WAS RECORDED FROM FULL SIZED OZALID PRINTS OF THE NIEUPORT FACTORY LAYOUTS AND PIECE PART DRAWINGS... RIGGING DATA WAS COMPILED FROM THE NIEUPORT CO. "DOSSIER TECHNIQUE, NOTICE DE REGLAGE."... THE ASSISTANCE OF THE AIR FORCE MUSEUM, WRIGHT-PATTERSON AFB, IS GRATEFULLY ACKNOWLEDGED... THANKS FOR PHOTOS ARE DUE TO PAUL MATT, PETER BOWERS, ROBERT RUST AND THE NATIONAL AIR MUSEUM...

1917 Nieuport 24 & 27	
STRUCTURAL DETAILS & LAYOUTS	
RIGGING DATA: LANDING GEAR, EMPENNAGE LAYOUTS DETAILS OF STRUCTURES	SCALE: 1"=12" OR AS NOTED
	SHEET 4 OF 4
DRAWN BY... BERGEN F. HARDESTY... 1956	

P. G. F. CHINN

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

Australia

Neat looking stunt job pictured on this page by Tony Farnan is powered by inverted O.S. Max 29 motor. Span is 48 in. and an 18 percent wing section is used (NACA 0018) in conjunction with full-span flaps. Both flaps and elevator are of built-up construction and the entire ship is silk covered. Total weight is 40 oz. and level flight speed 75 mph.

Tony tells us that, at the Victoria State Championships (in which he won first place in the stunt event with this model), control-line events attracted rather more entries than did free-flight. In class A team racing (.15 cu. in.), popular in Australia as in England, Oliver Tigers filled all places in the finals. Stunt and combat were a further proof of the wide acceptance of the O.S. Max in Australia, these motors powering three out of every five entries, including the winners, followed by Fox and K.&B. powered jobs. In the speed events, times were not exceptional, the fastest being by a Dooling 61 model with 133 mph. RC was more popular than ever and although virtually all entries were rudder only, reliability was notably good and no flyaways were recorded.

England

First production Diesel outside the U.S.A. to adopt the plastic O-ring type compression seal is a new model shortly due from the Frog factory. Known as the Frog "80", this new motor will have a bore and stroke of .400 x .392 in., giving a displacement of .0493 cu. in. and will thus fall conveniently into the popular Half-A class in the U.S.

Neat looking, the new Frog 80 is a shaft valve, beam-mount motor with integral exhaust stacks and vertical head finning. Another feature of U.S. origin is the nylon thread insert for the compression-screw which effectively precludes any possibility of a sudden loss of compression due to vibration causing the screw to loosen and run back.

Synthetic rubber sealing rings as a means of fitting comtra-pistons to the bore (as distinct from the normal practice of a lapped unit) came in for some ill-conceived criticism in Europe after their initial appearance on McCoy and Herkimer Diesels. It is interesting, therefore, to see them adopted by a leading British manufacturer. It is claimed that the Frog 80 O-ring has an almost indefinite life.

Western Germany

A new sort of construction for scale control-liners, teams-racers and the like, is reported to be receiving a certain amount of support in Germany. Briefly, the covering material is bristol-board clad with very thin aluminum foil. Can be glued on with slow-drying cement, gives an excellent impression of true Alclad and is virtually fuelproof.

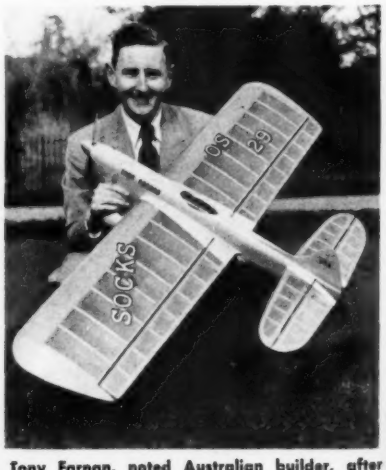
. . . Berliner Walter Fritsch, whose WAF 1 (.06) Diesel earned our respect when we tested one of the first models three years ago (and which has since gained considerable popularity) has a new 3.5 c.c (.20 cu. in.) Diesel. A work-horse, rather than a racehorse, it is intended for radio-control use and is claimed to be well up on the performance of existing 3.5 c.c. motors at the commonly used revs for RC

. . . Miniking transistorized receiver, first mentioned in last month's FN, is fitted with a new type Siemens relay with a coil resistance of only 280 (repeat, 280) ohms.

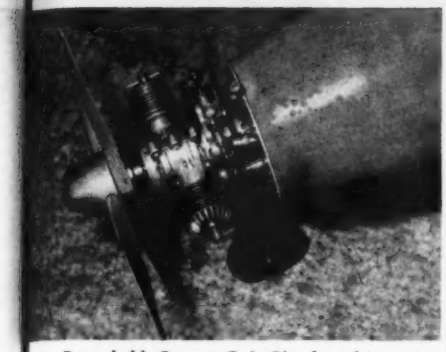
Holland

Some of the worst summer weather of the century was experienced during the past season in parts of Europe. The wretched conditions at Cranfield, England, for the World Power Championships was a case in point and a contest which suffered even worse was the third Dutch National RC Contest where a gale, rainstorm and thunder made radio flying to-

Well-known German model designer, Karl-Heinz Denzin, with A2 built by John Stewart, USAF.



Tony Farnan, noted Australian builder, after winning Victoria State Champs stunt event.



Remarkable Ruppert Twin Diesel used to power Stegmaier's latest RC. Built-in Compressor.

tally impossible. Only flight made at the meet was by a control-line seaplane, which, with a half-lap take-off run, was operated from one of the puddles . . . Some puddle!

Another RC contest was held later at the glider airfield at Terlet, near Arnhem; this time in more favorable conditions. In this the Amsterdam team of Medcof, Jansen, Meyer and Veenhoven took the first four places--in that order. There were no crashes and no flyaways.

Veenhoven is, of course, the manufacturer of the Dutch Typhoon engines and RC gear and the latest item from the Typhoon factory is a reed-valve backplate conversion set for Typhoon .15 Diesels. Fitted to the twin ball-bearing Typhoon R.250, it is said to give increased power, lower fuel consumption and easier starting. According to one of our Dutch correspondents who tested a prototype set-up against an Oliver Tiger, the power, above five figure rpm, was greater than that of the Oliver, to the extent of an increase of 900 rpm at 11,000. Personally, we would hesitate to endorse the possibility of stock reed-valve R.250 performance being greater than stock Oliver performances, but hope to have the opportunity of a vertification of the reed-valve R.250 in due course.

South Africa

The Union of S.A. is one of the few places where modelers are not too bothered with import restrictions and where, in consequence, model merchandise from all parts of the world gets a pretty even work-out. As far as engines are concerned, preferences still favor American glowplug engines in general over all others, including recently imported Japanese motors. Diesels are not too popular despite some convincing demonstrations of above average performance by Oliver Tigers and Mach-1's. Rubber used by Wakefield enthusiasts includes T.56, Dunlop and Pirelli. Though the preference has been for Pirelli, followed by Dunlop, varying quality, of late, in both these makes (also being experienced elsewhere) is resulting in some revised opinions.

Argentina

Results of the Argentine Nationals came in too late for inclusion in an erlier FN and we were interested, threfore, to have the comments of Dick Carlstein of Buenos Aires, now in New York, on some aspects of the meet.

A unique feature was seen on RC winner Iriarte's model. This was a reversible dihedral wing in which the angle was controlled by spring loaded struts, allowing the angle to change when the model was inverted. Recovery from the inverted flight position was performed by means of an outside half loop.

The standard in Wakefield flying ap-

(*Continued on page* 46)

6 NEW MODELS FROM SCIENTIFIC

Now at your favorite hobby shop! These 6 sensational new models from SCIENTIFIC. They're simply terrific performers! Every one a super value! Here's modeling fun and thrills like you never dreamed possible . . . and for so little money!

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features JET FIGHTER styling

18" WINGSPAN
For Gas Engines
.039 to .074
Deluxe profile U-Control model . . . with a formed bubble canopy. All prefabbed.

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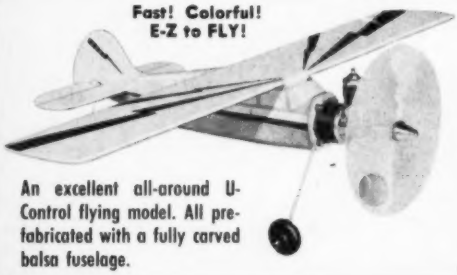
$1.95 LUCKY RACER

18" WINGSPAN
For Gas Engines
.039 to .074
Terrifically fast flying model of this Goodyear type racing plane. All prefab model with a carved fuselage, etc.

Fast! Colorful! E-Z to FLY!



RED FLASH

18" WINGSPAN
For Gas Engine
.039 to .074

An excellent all-around U-Control flying model. All prefabricated with a fully carved balsa fuselage.

$1.69

BEECH "BONANZA"

18" WINGSPAN
For Gas Engines
.039 to .074
An exciting U-Control scale flying model. All prefabbed with carved fuselage, etc.

$1.95

LARK SPEEDBOAT

$2.50

20" LENGTH. 7" BEAM
New streamlined speedboat for any Outboard Engine . . . gas or electric. Features advanced "Waterama" bow design. All prefabricated.

ALIVE WITH ACTION

CESSNA 182 Tricycle

18" WINGSPAN
For Gas Engines
.039 to .074
Brand New! U-Control scale flying model of this world famous plane. All prefabricated with carved fuselage, etc.

$1.95

2 MORE HIT MODELS . . . FROM SCIENTIFIC

Terrific Fun!
TAKES OFF AND LANDS ON WATER

PIPER SEA SCOUT

18" SPAN For .035 to .074 ENG. Exciting fly-it-yourself seaplane! It's U-Control . . . easy to fly and a cinch to assemble from its fully carved fuselage and all prefabbed parts.

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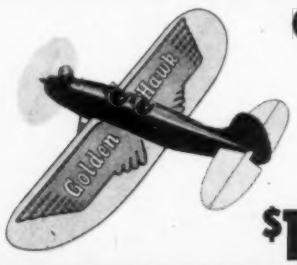
GOLDEN HAWK



18" WINGSPAN
.035 to .074 ENG.
Extremely C-O-L-O-R-F-U-L flying model with a great big expansive wing. All prefabbed with carved fuselage, etc.

$1.95

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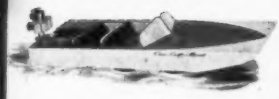
If no dealer is available, add 25c (postage & packing) to cost of model

OUT-OF-THIS-WORLD
Model Values
FROM SCIENTIFIC

STINSON RELIANT $1.69
SPAN: 18" For .035 to .074 Eng.
Unusual 'gull' wing gives this U-Control model ...

F-94C "STARFIRE" $1.69
SPAN: 18" For .035 to .074 Eng.
U-C model of this sensational 600 m.p.h. jet. Flies like a dream. Prefabbed, carved fuselage.



Christ-Craft "HORNET" $1.95
LENGTH: 18" For Any OUTBOARD Eng.
Real speed demon! Semi-scale with our new 'Waterama' design. All prefabbed. For R/C too.

NO. AMER. TEXAN AT6 $1.9
SPAN: 18" For .035 to .074 Eng.
Our extremely popular scale model of the AT6 Texan. Carved balsa fuselage, ...

EXPRESS CRUISER $1.95
LENGTH: 18" For Any OUTBOARD Eng.
Chris-Craft cabin cruiser model (semi-scale) with our new 'Waterama' design. All prefab kit.

RED DEVIL $1.69
SPAN: 18" For .035 to .074 Eng.
Terrifically colorful all around sport flyer. Practically pre-built together. Prefabbed ...

STUNT MASTER $1.59
SPAN: 18" For .035 to .099 Eng.
The stunt-n-est 1/2A stunt plane ever ... prefabbed with a carved fuselage, etc.

MISTER MULLIGAN $1.69
SPAN: 18" For .035 to .074 Eng.
Scale model of this famous trophy race champ. U-Control. All prefab, w/carved fuselage, etc.

U.S.S. NAUTILUS $1.98
18" Hull. Rubber Power Included.
Actually operates like a real sub. Submerges! Surfaces! Compact, carved balsa hull.

PIPER TRI-PACER $1.69
SPAN: 18" For .035 to .074 Eng.
Tricycle landing gear . . . safer landings on this scale U-C model. It's prefab, a terrific flyer.

LITTLE IKE $1.19
SPAN: 18" For .035 to .074 Eng.
Exciting U-Control model of this granddaddy of 'Goodyear Trophy Racers.' Super-prefab. Profile.

LITTLE STINKER $2.50
SPAN: 16" For .020 to .074 Eng.
Barry Shelton's (Pitts Special) ...
stunt flyer. Mighty colorful, all prefab model.

NO. AM. T-28 TRAINER $1.19
SPAN: 18" For .035 to .074 Eng.
Fly-it-yourself version of U.S.A.F. training plane. It's U-Control, a rugged profile flyer. Prefabbed!

XP-300 DREAM BOAT $1.98
"1/2A" Eng., CO_2, or Elec. Motors
Our exclusive aeronautical design. Prefabbed ... 18" carved balsa hull, etc., etc.

F4U-5N "CORSAIR" $1.19
SPAN: 18" For .035 to .074 Eng.
Profile fly-it-yourself model of famed WW II ... U-Control. Flies like a dream. Prefab.

F-100 SUPER SABRE $1.95
SPAN: 18" For .035 to .074 Eng.
Scale model of first U.S. supersonic jet fighter. A terrific flyer. All prefabbed kit.

TORPEDO SPEEDBOAT $2.50
LENGTH: 20" BEAM: 3"
Sleek, new speedboat for OUTBOARD engines. Prefabbed, w/ genuine mahogany veneer hull.

LITTLE SPITFIRE $1.19
SPAN: 18" For .035 to .074 Eng.
Fly-it-yourself version of famous hero of the 'Battle of Britain'. Profile U-Control. Pre-fab.

BEECHCRAFT "17" $2.95
SPAN: 16" For .020 to .074 Eng.
U-Control, prefabbed model has carved balsa fuselage, formed balsa wings, metal cowl, etc.

RIVIERA $3.50
For "1/2A" Eng. or Electric Motors
Authentic Chris-Craft replica with 12" carved balsa hull & brass fittings. All parts finished.

FIREBIRD RACE CAR $1.89
LENGTH: 18" For .035 to .074 Eng.
New, futuristic race car that speeds to 60 m.p.h. It's prefabbed, 4 rubber wheels, carved body, etc.

BUCKEYE JR. $3.95
LENGTH: 14" For .020 to .074 Eng.
A "baby" of a speedboat. Prefabbed with ... carved balsa hull, brass fittings, etc.

"DART" SPEEDBOAT $1.89
For 1/2A Engines .035 to .074
Four-ski speedboat, replica of U.S.N. Convair ... "Dart." All prefab model. Exciting to race!

LITTLE MERCURY $1.50
SPAN: 18" For .039 to .074 Eng.
U-Control carved fuselage model. It's completely prefabbed. A cinch to assemble.

BUCKEYE JR. CABIN $3.95
For "1/2A" Eng. or Electric Motors
Here's our sleek cabin cruiser, with a removable cabin, 14" carved balsa hull, etc., etc.

LITTLE MUSTANG $1.95
SPAN: 18" For .020 to .074 Eng.
Famous escort fighter model. Prefabbed. Features carved balsa fuselage, formed balsa wing.

FREE!
Send for our new, colorful 1956 catalog. See your dealer . . . or send a postal card.

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If no dealer is available, add 25c (postage & packing) to cost of model

Radio Control News

(*Continued from page* 31)

to model RC work. The transmitter features an MOPA circuit (Master Oscillator-Power Amplifier) and a built-in meter. The receiver uses 4 subminiature tubes and is compactly packaged.

Perhaps the most popular type of single-channel receiver in use today is the "two-tuber." This receiver uses a gas tube as the detector and features ease of construction, a minimum number of parts, good sensitivity and dependable operation. Many, many kit manufacturers produce such receivers and, therefore, we mention only those we had opportunity to test. The first unit is the Deltron R100 receiver and T100 transmitter. The Deltron equipment comes ready to operate, factory tested and adjusted. The receiver sells for $24.95 and the companion T100 transmitter is about the same price.

Polk's Modelcraft Hobbies, 314 Fifth Avenue, N.Y.C., has a kit featuring a printed-wiring chassis and the finished unit may be protected by placing it in the plastic parts box, used for packaging. Selling for $8.95, less tubes and $12.95 with tubes, it can also be obtained built and factory tested for $17.59. The relay is extra on this model and may include the Gem relay or the most popular RC relay of all, the Sigma 4F. The companion transmitter is the Aristol MOPA, also featuring a printed-wiring chassis for ease of assembly and reliable operation, which sells for $14.95 in kit form, including everything but batteries or ready built and tested for $19.95, less batteries.

Other kit manufacturers of the two-tuber circuit and simple one-tube transmitters, include ESSCO, 58 Walker Street, N.Y.C.; Ace Radio Control, Higginsville, Mo.; Mitron Radio Control, Circle, Mont.; Gyro Electronics, 325 Canal St., N.Y.C.

A late model receiver, just over from Germany and distributed by Wilshire Model Center, 1326 Wilshire Blvd., Santa Monica, Calif., is known as the Standard 20 MK II. This receiver is a twin hard-tube job, employing subminiature tuning eye, thus eliminating the need for a tuning meter. Standard 3S4 tubes are used and the unit will function on from 30 to 60 volts B supply. Price is $29.95.

Another operating spot is 465mc and, in this case, you cannot build your own transmitter. Nor is it likely that the average RC builder would have the equipment to check out a receiver at that frequency. Two companies, however, make ready-to-use equipment for 465mc use. First is the Citizen-Ship 465. The $34.95 transmitter is pretuned and factory adjusted. The Citizen-Ship AR receiver sells for $24.95 and the larger CR unit, with built-in antenna, sells for $29 95. This equipment manufactured by Citizen-Ship Radio Corp., Indianapolis, Ind.

The latest 465mc gear to reach the market is the Babcock tone-actuated equipment. A single transmitter provides two audio channels and receivers may be had which will operate on either or both frequencies. See NEW ITEMS for further details.

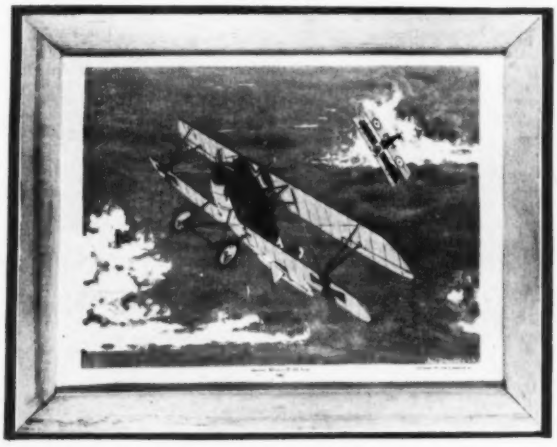
New Items

In keeping with our review of RC gear for the newcomer to this phase of model building, we present the very fine Ungar Soldering and Electrical Kit. Proper soldering is essential in building your unit from a kit, from purchased parts or in making your installation. This $4.95 kit contains the following item; a heavy-duty handle, an excellent heavy-duty soldering

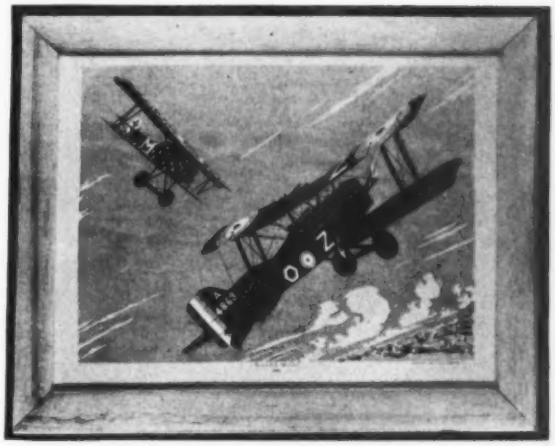
(*Continued on page* 42)

AIRCRAFT PAINTINGS

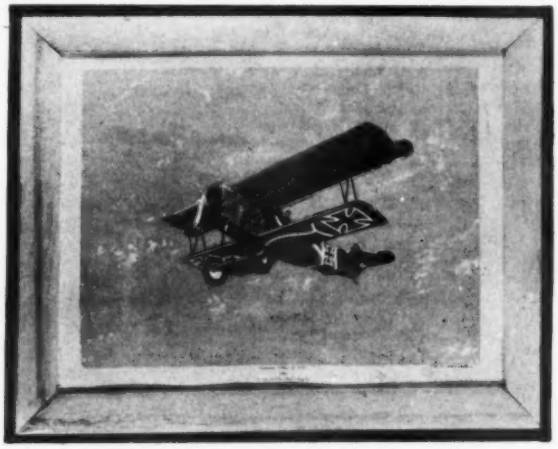
WORLD WAR I AIRCRAFT IN FULL COLOR



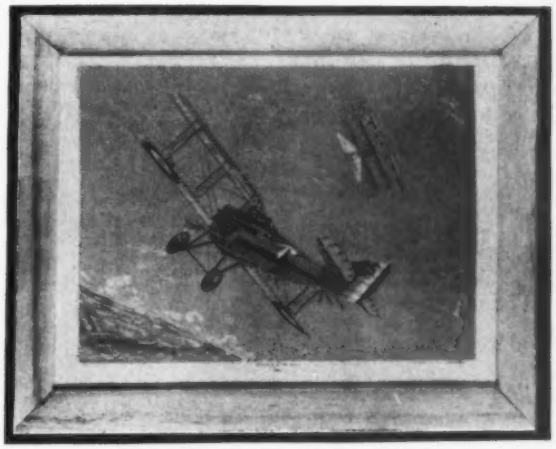
GERMAN ALBATROSS D-III SCOUT (Painting No. 1)
Painting shows Albatross being attacked by British Sopwith Pup. All in full battle color, grey, red, brown, etc. against a blue, white fleeced sky. Great detail as to wire rigging, strut detail etc. can be seen in the Painting. This, as are all 4 of the Paintings, is full of color and very striking. Large size 17" x 14".
Price $3.98 plus 25c post ☐ Special all 4 Paintings only $11.98 ☐



BRITISH S. E. 5 SCOUT (Painting No. 2)
Painting shows British S E 5 of Royal Air Force Squadron 85 being attacked by German Fokker D-7. The S E 5 is in Olive with all markings Insignia, machine Guns, Strut detail clearly shown. The attacking Fokker D-7 is in full multi-color Camouflage pattern colors. This is a very outstanding scene. Large size 17" x 14".
Price $3.98 plus 25c post ☐ Special all 4 Paintings only $11.98 ☐



GERMAN FOKKER D-7 (Painting No. 3)
Painting shows German Fokker D-7 in brilliant Scarlet against a blue white fleeced sky. This is in great detail, as are all the Paintings. The Fokker D-7 was one of the most popular of all the Paint-Planes, being flown by many German Aces. The D-7 was featured in the old photoplay "Hells Angels". Large size 17" x 14".
Price $3.98 plus 25c post ☐ Special all 4 Paintings only $11.98 ☐



FRENCH SPAD (Painting No. 4)
Painting shows a Beautifully detailed Spad complete with Stork insignia pursuing a German Fokker Triplane. This is in Great Detail and full of color. The Triplane is in full Camouflage multi-color pattern colors. The Spad was very popular right to the end of the War. This black and white photo does not do justice. Size 17"x 14".
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tip; terminal connectors; high quality 5-core solder; insulating tape and a circuit tester. See your local hardware or radio supply house.

Ace Radio Control Box 301 Higginsville, Mo., with branches at Box 1661, Burlington, N.C., and Box 18, Carmichael, Calif., offers a new catalog, number 57-1. In addition to a wide variey of kits and parts, there are also many makes of ready-built equipment. Photographs and circuit drawings are included.

The new Babcock Models relay, model BR-3, which was mentioned last month, has been thoroughly tested by the writer and we can give the following data: Construction and design of this $4.95, 5000 ohm relay, are of high standards. The points, while adjustable, did not have too great a range of adjustment. This is no detriment, however, since the contact arms can be bent for large gap adjustments and the screw settings used for fine adjustments. A balanced armature is used and the relay was immune to vibration in the order of 60 to 3600 cycles at an amplitude of up to 1/16". The heavy contacts (⅛") should carry practically any current used in RC work. This relay looks like the ideal unit if you are looking for something small, compact and reliable.

We have just field checked the new Babcock 465mc equipment, which was described in a previous issue of MAN. Using the standard 2-channel BCT-7 transmitter and a single channel BCR-8B receiver, here are our findings. First of all, the equipment is beautifully packed, a feature which assures it arriving in your hands in good shape. Since this equipment is radical in design and operation, it is important that you read the instruction booklet thoroughly before placing the transmitter and receiver in operation. Under no circumstances should you attempt to alter or tamper with the RF section of the transmitter. Incidentally, this transmitter has an exceptionally high RF output for 465mc. The receiver employs two antennas for plane installations and uses but one for boat or car work. Diode is used, in conjunction with a tuned circuit and therefore no RF amplification is obtained. This means that the installation procedure should be followed exactly.

After following the instructions to the letter, and having the equipment work "right out of the box", we experimented to find out how far off the average modeler could be and still obtain reliable operation. Without going into what we did, we'll say this equipment is fantastic in its reliability. Tests were conducted under rather unusual conditions and the equipment still functioned. With the boat antenna, the range of 400-500 feet, as given in the instruction manual, was obtained with no trouble. With the plane installation, the receiver being about 6" off of the ground and the transmitter held 30" off of the ground, the range was in excess of 400 feet. This range can be multiplied about 6 times when the plane is in the air, thus giving more than ample range. One ground test conducted 300 feet from the receiver. with the transmitter 100 feet into a small wooded area out of sight of the receiver. Operation was normal.

The receiver requires a 30-volt battery for power; no filament supply is needed. The manual states that this 30-volt hearing aid batterv may be used until it drops to 24 volts. We found this to be true, and the 24-volt point was critical due to the internal resistance of the battery building up. Actually, we got several feet of range with the B voltage, from a fresh supply, at 16.5 volts. Another in-

stallation item which must be adhered to, is the use of wooden push rods. Two channels can be operated simultaneously. Although not available at the time this column went to press, Babcock plans to market a pulsing unit and a proportional servo, thus adding to the versatility of the equipment.

Briefs

E. Schoenberg, of the Seattle Radio Aero Club, 2759 E. 94th. Seattle, Wash., gives a resume of the 3rd annual SRAC RC contest held last fall. RC scale event included J-3 Cubs, Tri-Pacers and a PT-19. The PT-19, by Gene Britzius, captured first in the scale event and the multi-channel event. The Seattle group gets their main competition from the Boeing Aerojets.

• • •

Further down the west coast from Seattle, we learn of the happenings of the East Bay Radio Controllers, in the Oakland, Calif. area. Highlight was a report on Bill MacKaracher's RC speed job. Powered by a McCoy .60, this model literally thundered down the runway before becoming airborne. At a distance of about 300 feet out, it reversed its climb and hit the runway at an estimated speed of 80 to 90mph. There was very little left of ship, even for a souvenir hunter.

• • •

Further down the coast is the LARK's nest, in the vicinity of Los Angeles. Howard Bonner is still cleaning up in the multi-channel circles with his Smog-Hog. A father and son team, composed of Dr. Hauck and son Gary do a bit of private dog fighting. Doc flies his Cruiser on 29.7mc and Gary uses his Mambo on 27.25mc.

• • •

On the other side of the country, Ralph Corelle of RC/NC group, Burlington, N.C., announces plans for three classes of RC flyers. They also plan to build a Field Interference Monitor and Checker and discussions are held as to what to do about field regulations and transmitters "on" during flights. Here again, with regard to field regulations, a little common sense and courtesy will help you keep your flying field. Don't leave it cluttered with fuel cans, broken models, etc., especially if you have been given permission to use someone's property. Most flying sessions are making out pretty well nowadays as far as interference from transmitters other than that used by the flier. All antennas are removed except for the person doing the flying.

• • •

Quite a few readers have requested to see three-view sketches of the planes used by other RC fliers. We'll be glad to make finished drawings from pencil sketches if any of you have an unusual or original design which you feel would be of interest to other builders.

• • •

Warning to RCers

It has come to the attention of the AMA RC Committee that a dangerous type of transmitter modulation is being used by some RC modelers. This type of modulation employs a buzzer operating directly into the grid of the crystal-controlled transmitter. The danger is caused by the fact that a buzzer-modulated transmitter may radiate on many widespread frequencies in addition to 27.255 mc. This is in direct violation of Section 19.34 of Part 19—Citizens Radio Service of the FCC Rules—which states that all emissions must be within ±25 kc of the 27.255 mc center frequency.

The RC Committee strongly recom-

mends that buzzer type modulation should not be used in RC transmitter application.

Let's maintain technical control of our own ranks so the FCC won't have to step in and deprive us of our hard-earned frequencies!

Walt Good
AMA—RC Committee

The Great Propeller Mystery

(*Continued from page* 14)

seven inches) and shaft is to be tightly fastened, make a ¼" square "U" at the front end. Sink it into the wood. Give hub a few turns of thread and cement to keep shaft secure.

Over 8" size should have pine or plywood reinforcement around the hub, both front and rear to prevent wear.

THREE-PIECE PROPS: These have a hub from hard balsa, cut to a size that gives proper pitch, and blades from sheet balsa. (Figure 9). They work well on planes up to 24" wingspan, or for lightweight indoor models.

Don't use too much pitch. Check the rule above for proper measurements of the hub to get blade angles right and equal for both sides of hub. Size and shape of hub is the key.

HAND-CARVED PROPS: Give best results if well made. (Figure 10). Draw out block, saw away excess. Carve the back first. A wood rasp, heavy sandpaper, then fine sanding will make it a good job. Balance carefully. Use same care in mounting shaft. (Figure 11). Pine or metal plates over front and rear of hub is a good way to keep prop from wearing or enlarging shaft hole. (Figure 12).

Props may be carved from a smaller block of balsa by quarter-sawing it. (Figure 13). Check the rule for proportion of thickness to width to diameter.

BROKEN PROPS may be used by fitting the blades into a hub or by counterbalancing the blade that still is connected to the hub with weights. (Figure 14). This applies only to gas models.

PLASTIC PROPS: Usually well formed and efficient. But often too small in kits. Step up size an inch or two and results will be better. All sizes of plastic props up to 8" are available at low prices. They're too heavy for good indoor flying but ideal for sport flying, especially outdoors. The shaft can be put in then bent into a U. It doesn't have to be glued. Use beads or small washers to keep it from rubbing on nose block.

FREE-WHEELING OR FOLDING BLADE props are used to improve glide on outdoor duration models. A spring usually works the free-wheeling by disconnecting the prop from the shaft so it can turn in the breeze. (Figure 15). The folding blade type isn't too hard to make. When the rubber power is turning the prop air holds the blades forward in position by prying against them. When the rubber is exhausted, the wind folds the blades back along side the model's nose. (Figure 16).

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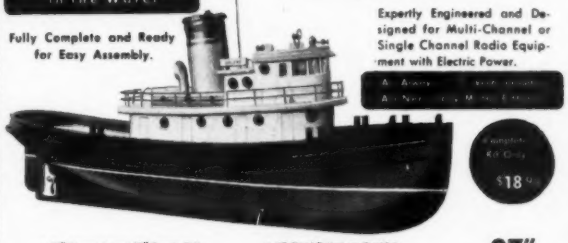

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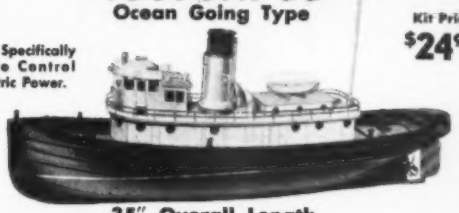

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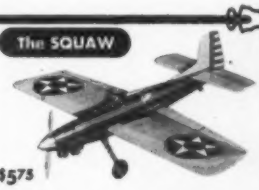

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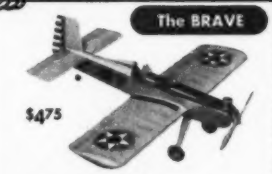

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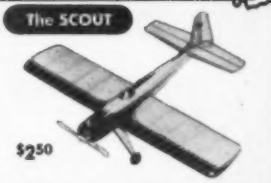

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Foreign Notes

(*Continued from page 37*)

pears to have been high, with winner Oscar Parera making a perfect score and the tenth man recording as high as 14.03. Weather did not favor the Nordic A2's and models capable of 2:20–2:40 were returning as low as 1:30. Winner was Honda with 13:40 total. Weather improved later and Massetto and Bonvieina, flying Continental type models with aluminum tube fuselages and ultra-thin wings were averaging a consistent 2:45.

Free-flight gas was in two main classes: FAI and a combined event for A, B and C. The latter was not well supported and most enthusiasts now appear to build for the international class. Stunt was won by Ernesto Cereda (Fox 35) who has been stunt champion for the past four years.

Italy

Speeds in the FAI Class I (.15 cu. in.) category continue to rise and a new Italian record claim of 215 km./hr. (nearly 134 mph) has been made by Ontonio Marcani. Powered by a Super-Tigre G.20S turning a 155 x 250 mm (roughly 6 x 10) prop, his foot-long model has a metal pan, balsa and ply wings and flies clockwise.

Yugoslavia

One of the highlights of the 1956 World F/F Champs was the performance of Yugoslavia's Emil Fresl who, flying a model powered by a .13 cu. in. Diesel of his own construction, missed a place in the fly-off by only three seconds to take fourth position behind the two British and one American top place winners. Fresl has been in the forefront of Yugoslav modeling for the past six years or more, using an early Torp 15, has been no mean performer in speed events also.

France

Report from France mentions a new Micron .15 glow motor which is intended to fill the urgent need there for a 2.5 c.c. class motor capable of competing in the present international class.

. . . Organized by the SAF Chad Club, a meet scheduled to be held at Chateauroux features two free-flight gas classes: one using present 200 grammes/c.c. power loading and the other using the proposed 400 gramme loading. Such initiative on the part of clubs is admirable. Practical indication of model performance obtained thereby should greatly help intelligent formulation of future FAI rules.

Italy

Fantastic speeds in the official .15 cu.in. class were reached at the World C/L Championships held in Florence, September 29/30. Winner Ray Gibbs of Great Britain achieved 211 km./hr. (131 mph) on regulation contest lines. Later, using the thinner lines permitted for World record attempts, he raised this to no less than 225 km./hr. (nearly 140 mph).

Motor used by Gibbs was a special built by Fred Carter based on a McCoy Red Head 19, reduced from 3.2 to the required 2.5 c.c. Of stock, or near-stock, motors, the largest number were Super-Tigre G.20's. Second place winner used a G.20 modified to disk valve induction. Italian team hope and former world record holder, Amato Prati had a very hot G.20 which was estimated to hit 20,000 rpm in the air. Unfortunately, after two crashes in test flights, the model tore loose on the final official flight and was wrecked.

In Brief . . .

. . . New British .60 class speed record by Gibbs of 159.8 mph is highest official speed ever in Britain.

. . . Claimed for the German B.W.M. 1001G glowplug .60 motor: 1.68 bhp at 17,000 rpm.

. . . Confirmed: 1956 Soviet International speed event winner Beck of Hungary used Super-Tigre G.20. Motor, modified to rear disk induction, turned very coarse pitch. prop: 150 x 270 mm. (5.9 x 10.65 in.).

Import Review

(*Continued from page* 19)

ment glow motors, The A-M 10 takes this a stage further in respect of material sections and therein lies, partly, the clue to its exceptionally good performance. A very heavy Meehanite cylinder liner is used (it has a wall thickness of .069 in.—over 1/16"—at the thinnest part), over which is closely fitted an adequately finned dural barrel, clamping the liner to the case by three through bolts. The diecast crankcase contains plenty of metal and forms the bearing for a really hefty shaft having a 5/16-in. x 1 in. journal and an overlapping crankpin of nearly 3/16 in. diameter. All this adds up to immense rigidity and the minimizing of losses through localised overheating and distortion.

Bore and stroke are 27/64 in. x 7/16 in., weight three ounces. The motor delivers its peak performance at a shade over 14,000 rpm and, on our test, the output here was .118 bhp, which is better than for many .09 glow engines. The maximum torque is developed at around 10,000 rpm, where the equivalent b.m.e.p. on test was 60 lb./sq.in. Performance at lower speeds is therefore outstandingly good also and the motor will turn an 8 x 4 prop at 9,000-10,000 rpm, or a 7 x 4 at around 12,000 rpm.

Super-Tigre G.29 Outboard

Thus far, the only foreign manufacturer to follow the American lead by introducing an outboard, is Signor Jaures Garofali, whose company, Micromeccanica Saturno of Bologna, Italy, make the world famous Super-Tigres.

The G.29 Outboard is a rather more heavily built job than previous outboards and weighs 6.9 oz. It is a really toughly-made motor with such refinements as an oil-filled bevel gearbox to the prop with the propshaft running in a bronze gland. The lower housing, complete with cavitation plate and skeg, is linked via a really solid swivel bracket to a strong transom clamp. Angle of rake is adjustable by means of a screw and locknut.

The power head is a glowplug version of the .049 cu.in. G.29 aircraft motor which we featured in our first Import Review. The main difference is in the use of a new shaft with extended crankpin, which engages the slotted disc of the short coupling shaft to the vertical driveshaft. The crankshaft also has the induction port relocated to give clockwise rotation, thus permitting the use of normal right-hand threads and a left-hand propeller.

Between the power head and lower housing is the baseplate and drive coupling. The baseplate is a rigid diecasting which is clamped between the crankcase and lower housing flanges by means of two screws. It has a deep integral boss in which the coupling runs. The baseplate also forms the bottom of the large capacity diecast fuel tank. This is secured by a single screw through the top enabling it to be quickly dismantled for cleaning—a useful feature in a motor of this type, where there is always a possibility of water finding its way into the tank.

The motor, as a whole, is beautifully made and runs perfectly. It is aircooled and features the use of an integral plug element in the head. This is clamped in position by the screw-on cylinder barrel in a similar manner to that used on the McCoy .049 glowplug model.

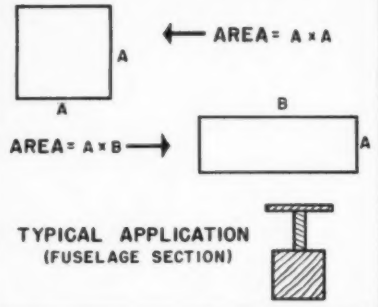
Enya 19 Model 4003

The Enya 19 Model 4003 is a new motor developed from the Enya 19 4002 which was decribed in our recent round-

(*Continued on page* 52)

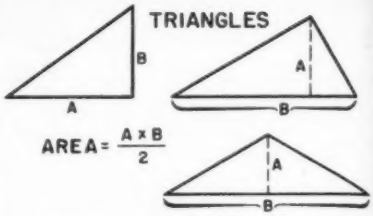
AREAS, LENGTHS AND VOLUMES

SQUARES AND RECTANGLES



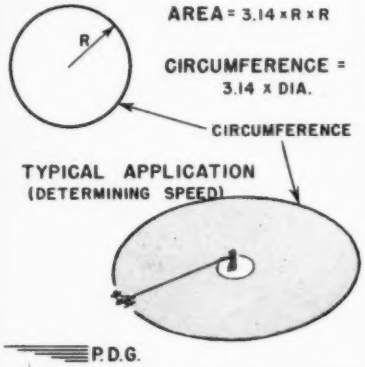
TYPICAL APPLICATION (FUSELAGE SECTION)

TRIANGLES



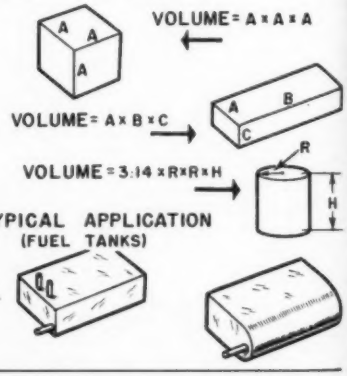
TYPICAL APPLICATION (WING)

CIRCLES



P.D.G.

CUBES AND BARS



up of Japanese engine production. It has all new castings, new crankshaft and a revised liner. In fact, the only important component which remains unaltered is the piston and rod assembly.

Most of these changes have been directed towards improving breathing. Thus, air enters through an enlarged venturi (which can be further enlarged by removal of a detachable choke tube) and thence through an exceptionally large crankshaft port, the biggest yet seen on a 19. This latter, in fact, gives an induction period of no less than 225 degrees of crank angle—40 degrees more than the already quite generous timing of the earlier model. The induction passage through the shaft is only very slightly enlarged and adequate shaft strength has been maintained by increasing the journal diameter from .355 in. to .375 in. Bypass timing remains unchanged, but faster transfer of gas from crankcase to combustion chamber is encouraged by widening the bypass passage and by lowering the bottom edge of the cylinder port so as to present a less acute entry.

In most other respects the Enya follows the trend of typical modern glow 19's. A light, lapped cast-iron piston with straight baffle is used. The conrod is bushed at the lower end and a full-floating wrist-pin with aluminum endpads is employed. The drop-in liner is flanged at the top where it is clamped in position by the diecast and machined alloy head. This is secured by four screws and no gasket is used. A one-piece diecast crankcase and cylinder barrel is featured, with detachable front bearing housing and a bronze main bearing. The engine has a "square" bore and stroke, 16 x 16 mm. (.6299 in.). giving a displacement of .196 cu.in. Weight 5.2 oz.

Peak output is approximately .35 bhp at 14/15,000 rpm. We found that the Enya 19 started easily and handled nicely.

Frog 149 Diesel

Unlike most foreign motors, Frogs are produced by a very big organization, the International Model Aircraft division of Lines Bros. Ltd., who also have subsidiaries in Canada, Australia, South Africa and New Zealand. Frog engines have seldom been noted for originality of design or record-breaking performance, the makers preferring to concentrate on the production of sound, low-cost motors for general purpose use. However, some modification of this policy now seems evident

with the recent introduction of new .09 and .15 cu.in. models.

The .09 model, known as the Frog 149, has a half-inch bore and a stroke of .460 in., giving a displacement of .0903 cu.in. or 1.480 c.c. It weighs 3.3 oz. and is of the beam mount type. Main feature of interest is Frog's new "Vibra-matic" induction unit, which works on the clapper valve principle.

There are four main parts to this assembly. Resembling a normal type of crankcase rear cover, is a deeply recessed backplate with ports, top and bottom, into the crankcase interior. Fitted to this is a carburetor unit with downdraft intake opening into a large hemispherical chamber. This has a rim that fits in the recessed backplate and against this rim is seated a .005 shim steel disk or diaphragm. Contact is maintained by means of a large diameter coil spring in the backplate recess.

Operation of the valve is quite simple and, of course, is fundamentally similar to that of a reed valve. Thus, crankcase depression, during the induction part of the cycle, causes the valve to be drawn inwards against the spring pressure, allowing mixture to be sucked from the carburetor, past the disc and through the backplate ports. When charging is complete, spring pressure closes the valve again.

The rest of the engine is conventional. A one-piece diecast crankcase and main bearing housing is used. It is fitted with a steel-backed Vandervell sintered bronze bearing and is tumbled to a satin finish. The cylinder liner is of case-hardened steel and has three radial exhaust ports and three inclined bypass ports. Piston and contra-piston are of centrifugal cast iron.

On test, we obtained an output of .130 bhp at a peaking speed of 13,000 rpm.

The Frog 149 Glowplug.

This is a glowplug version of the motor just described. A special flanged insert, carrying a standard short-reach glowlug, replaces the contra-piston of the Diesel model. The 19 Glow is faster revving, but not as powerful as the Diesel model. It is an easy starting motor and exceptionally rugged.

E.D. Bee Series II Diesel

The original E.D. Bee was first marketed in 1948. It quickly became popular on account of its modest price and easy starting and more Bees have been produced than any other 1 c.c. Diesel anywhere in the World. Unusual in what is essentially a beginner's engine, it uses disk induction and, unlike nearly all other Diesels, it has a loop-scavenged cylinder with diametrically opposed exhaust and bypass ports—like most medium and large displacement glow motors. A year ago the Bee underwent a complete structural re-design and appeared as the Series II model. Models produced during the past few months have also had a revised form of bypass porting.

The Bee has a bore and stroke of .437 x .400 in., giving a displacement of .060 cu.in. and it weighs 3.2 oz. It is not light for its size. Its horsepower output is quite modest. The average Bee owner, however, does not count these as advantages: he is primarily interested in a motor that starts easily, doesn't go wrong and will keep on going.

Our test of one of the latest 1956-7 Bees showed it to have all the easy handling characteristics of the early models. Maximum power output was .064 bhp at 10,700 rpm. Like all E.D.'s, the Bee is for beam mounting only.

Quickie Mail Plane

(*Continued from page* 17)

quite simple parts, it gives a realistic impression of the 150 h.p. Hispano-Suiza engine with which the M-1 was fitted.

Make the nose plug from a cross-grain lamination of 1/16" sheet. Carve the plug shaft from medium hard balsa. Use 1/16" aluminum tubing for the plug bushing. Add a ¼" copper washer as a bearing surface.

Finish the propeller from a 7" machine-cut balsa blank. Square up the prop hub to take the spinner. Drill it for the aluminum bushing. Balance the prop carefully. Carve the spinner from soft balsa. Notch it to fit the prop hub. Cement the spinner in place and drill for the bushing. Add a 1/32" sheet backplate on the spinner. Cement on a ¼" copper washer.

To make the free-wheeling unit shown cut a piece of tubing and insert a piece of straight pin. Make the right angle bends as indicated. Bind the unit in place with thread and cement thoroughly.

Bend the winding hook free-wheeling arm first and insert the shaft through the prop. Slip on two ¼" brass washers and put on the nose plug. Form the motor hook after assembly of these parts. Recheck prop balance to minimize vibration.

Make the landing gear legs from .031 wire. Bend the last ¾" of the rear wires parallel with the main legs. Bend the tips of the wires into small right angle hooks. Put the brace wires in position and aline Bind the legs together with thread and cement securely.

Make the wheels from cross-grain laminations of 1/16" tubing. Use ¼" copper washers as wheel collars. A drop of cement on the axle ends will hold the wheels in place.

Build the wing in left and right panels. Trim the leading and trailing edges to complete the airfoil shape before joining the panels at the center section. No separate center section is made. Block the panels up over the plan at the center section position. Dihedral is 1" at the tips. Cement in the shaped center section pieces. Allow ample drying time.

Position the aluminum tube strut receivers on the under side of the wing. Cement them securely to the wood and cement strips of Jap tissue over them for added strength.

The tail surface frames are made from 1/16" square balsa. Add the 1/16" sheet corner pieces to strengthen the indicated joints.

Cover the model with Japanese tissue of desired color. Use clear dope as adhesive. Cut pieces of tissue for the fuselage sides, the top, and the bottom. The rudder and stabilizer are covered on both sides. Cover the wing in sections to prevent wrinkles. Dope the paper down to the section outlines only. Dot not attempt to dope to every rib or the spar.

Spray the covered parts with water to shrink the tissue. Block and pin the wing down on a flat surface to minimize warps. If care is used, the tail surfaces can also be water shrunk. Give all water shrunk parts one coat of thinned clear dope.

Assembly of the Ryan is very simple. Cement the stabilizer in place first. Aline it carefully with the fuselage. Cement the rudder on, truing it up with the stabilizer and fuselage. Add the 1/16" sheet tail skid. The wing is held in position with two small rubber bands.

Make the four wing struts from 1/16" x 3/16" balsa. Sand them to a streamlined cross-section. Form the four left and four right strut pins from .024 wire. Make the angular bends as indicated. Bind the pins on with thread and cement. Do not cement the struts in the receiver tubes. The wing is meant to be removable and to give in case of a crash.

Details may be added as desired. Control surface outlines are cut from black tissue and doped on. Select 2" decals for the words "AIR MAIL" on the under side of the wing. Use ¾" letters for the "U.S. MAIL" on the fuselage. The "RYAN M-1" markings on the rudder are 5/32" decals.

Give the spinner, nose-section, cockpit formers and wing struts a coat of colored dope to harmonize with the tissue used. Finish the cylinder blocks and exhaust stacks with black or engine gray. Dope the tire edges black and cement on silver-doped paper discs. Instruments can be cut from bond paper. Cement to a black-doped bulkhead and install in the rear cockpit.

Make up a six-strand motor from ¾" flat rubber. Slip a small piece of rubber tubing on the prop hook to prevent cutting. Hold the motor in place with a small rubber band. Lubricate the motor thoroughly with rubber lubricant.

The model will fly best with the wing struts removed. Balance for a long flat glide. Warp in a slight amount of right rudder to give a gentle right turn in the glide. Cement a small piece of 1/32" sheet balsa under the left side of the nose plug to make the model climb to the right under power. Test fly with a few hand winds to check the thrust setting and the power-to-glide transition.

The Ryan is not difficult to adjust but it is a snappy flying crate. Watch it when the thermals are on the move for the M-1 is quite capable of going "south"!

(*Continued on page 54*)

BILL OF MATERIALS
(All measurements in inches)

Five pieces 1/16 x 1/16 x 36 hard balsa: fuselage, tail surfaces, wing spar and tip braces; One piece 3/32 x 3/32 x 18 medium hard balsa: wing leading edge; One piece 1/16 x 3/16 x 18 medium hard balsa: wing trailing edge; One piece 1/32 sheet balsa: wing ribs, engine fill, spinner back plate; One piece 1/16 sheet balsa: cockpit formers, motor pin receivers, wing tips, stabilizer and rudder curves, wing root ribs, nose plug, wheels; One piece ½ x 1¾ x 1½ medium soft balsa: nose block; One piece ⅝ x ⅞ soft balsa: propeller spinner; Scrap balsa, medium soft: cylinder blocks, exhaust stacks; One 7 inch balsa propeller blank, medium hard; One piece .031 wire: landing gear, prop hook; One piece 1/16 diameter aluminum tubing: wheel bushings, prop and nose plug bushings, wing strut receivers, free-wheeling unit; Six ¼ inch copper washers: wheel collars, prop and nose plug bearing surfaces; Two ¾ inch brass washers: prop bearing; One small piece rubber tubing: motor hook; One sheet Japanese tissue 20 x 24; One tube cement; One small bottle clear dope; One piece ⅛ flat T-56 rubber 65 inches long; One small bottle rubber lubricant; Color dopes as desired; Letter decals as desired.

How to Fly Stunt

(*Continued from page* 28)

time simply because, while you are making up your mind to do something, the plane will have done it. If, however, the plane is fairly slow and easy you'll be right in harmony and can turn out a real fine pattern. The high gear, up-and-at-em pilot will get just as nervous and tight with a slow ship as a lazy bum will with a rocket ship. If you don't know which type you are, ask your best friend, or if rich, your psychiatrist. We do not mean you can't fly an opposite airplane, but we are trying for an optimum mating of pilot and airplane. The Air Force is very much interested in personalities when deciding on pilot classification, such as bomber or fighter. We can do well to step back and look at ourselves also.

How can we tell how a ship will perform by looking at the box? A real good estimate is the size. Most modern ships of 500 sq. inches or more will stunt at 70 MPH or under. The cleanness of the design is another factor. A small squared-off ship may be slow, while a clean large one may be real fast. We can adjust speed somewhat with props and engine runs, but each ship will have an optimum operating air speed. Try to find one of the type ships you are interested in and watch it fly. Observe the way it turns sharp corners and round maneuvers. Ask the man who owns one and try to analyze what you find out objectively. If you let yourself be sold on the wrong ship, for you, the time spent in building and flying is forfeit. A good contest stunt ship is a large investment of money and time and should be handled carefully. Built right and flown carefully it can last you for several years. Incidentally, cover it with silk or nylon. Lasts better.

As long as we have precision stunt, the ships we are flying now will do the job. We personally do not see any startling or profound changes in sight to obsolete them. On the strength of this it is worth the extra time spent in doing the job right. Also it has been proved that constant changing of airplanes, even the same

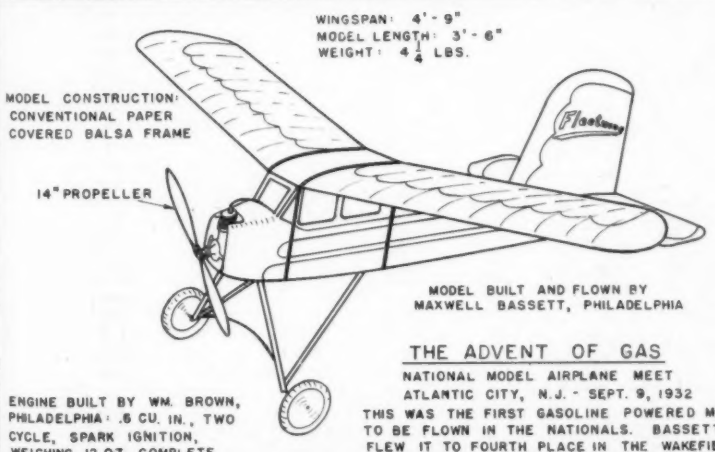
design, cuts down the consistency of performance, as it takes a while to get to know your ship. This is all a matter of "Do as I say, not as I do." If your interest is experiment, have at it. We get tired of our ships the moment all the bugs are exterminated and start out after the rainbow again.

The rules book is quite explicit about how the maneuvers are performed. It has been appalling to judge some of the patterns lately since most people seem to get worse from week to week. We've seen far too many people do the 1950 style horizontal eights, wrong approach to the overhead eight and vertical eight and maneuvers out of sequence. Obviously these pilots haven't cracked a rule book for years. Have you been losing out, when you thought you were real hot? Perhaps you are still in the dark ages too. Those of you who know the pattern can close one eye for awhile.

To pick up the more obscure points,

MODELS THAT MADE HISTORY

BY J. L. MACKENZIE



MODEL BUILT AND FLOWN BY MAXWELL BASSETT, PHILADELPHIA

THE ADVENT OF GAS

NATIONAL MODEL AIRPLANE MEET
ATLANTIC CITY, N.J. - SEPT. 9, 1932

THIS WAS THE FIRST GASOLINE POWERED MODEL TO BE FLOWN IN THE NATIONALS. BASSETT FLEW IT TO FOURTH PLACE IN THE WAKEFIELD FINALS WITH A FLIGHT OF 2 MIN.-55 SEC. HE ALSO ESTABLISHED THE FIRST OFFICIAL GAS RECORD OF 2 MIN.-32 SEC. SEVERAL MONTHS EARLIER AT A LOCAL MEET IN PHILADELPHIA WITH A STICK TYPE MODEL OF SIMILAR SIZE AND DESIGN.

ENGINE BUILT BY WM. BROWN, PHILADELPHIA: .6 CU. IN., TWO CYCLE, SPARK IGNITION, WEIGHING 12 OZ. COMPLETE WITH BATTERIES. THIS ENGINE WAS LATER MARKETED AS THE BROWN JR.

the first maneuver after deciding you can get through the pattern is a raised arm signal for at least one lap to tell the judges you are ready. Then fly your two level laps. After your climb, your flight is official, so finish it! Remain at your 45 degree altitude for three full laps and then execute your dive. The reverse wingover includes one-half lap of inverted flight, no more, no less. It is a good idea to stand in a fixed position when doing the wingover and the reverse wingover. This will help you split the circle precisely. You do three inside loops followed immediately by a half loop to get you inverted. Four laps inverted are necessary before doing outside loops. Do three outside followed immediately by a half outside to get you upright. The square loop is done with four precisely timed snaps of the wrist. Don't rush this one as you have plenty of room for it. The triangle is three snaps, with the last one scaring the socks off of everyone around. It can be done though. However, it is supposed to be equilateral, not just iscoseles.

The horizontal eights are entered at the intersection with either the outside or inside loop coming first. We prefer the inside first as do 80% of the fliers we have watched. Take pains to get both ends round and the same size. The vertical eight is entered inverted at an altitude of 45 degrees. Either top or bottom may be done first, the author prefetring the top. To complete the maneuver an additional half loop is necessary to bring you out upright. Use the whole 90 degrees for this one and don't let it get too wide. Roundness is important in all three eights. Overheads are approached with a vertical climb and start immediately overhead. The two sides of the eight are on an axis normal to the approach. We approach by facing down wind and pulling up when the plane is right in front of us. The eight is then across our body and across the wind. In this way they are easily made the same size. To get out of the overhead eight, continue the same direction you entered pulling out upwind. The square eight is about 10 corners and a real nerve quaker. Again we say, "don't rush it." On the landing if you are still with us, the approach is judged as well as the touch down and roll. All must be smooth. Each ship will have its own nasty characteristic on landing and the technique is for you to find. Try both three point and wheel landings and use whichever works best. Most ships will land themselves, so just freeze the handle. Oh, we always do three quick outside loops to clear the lines before landing. After landing smoothly, walk off like you did it every time. No one needs know.

You'll find that level flight and the bottoms of all maneuvers, except overheads, are to be at shoulder height, or 4 feet, which ever is greater. If you are 10 feet tall, fine, but us short folks have a problem. This is right close to the ground as you no doubt know. However, to get maximum points you must cut them short. We suggest using flags spaced around the circle at 6 feet or so for practice and work your maneuvers to them. After you get used to the timing it shouldn't be too hard to keep it up. See why we recommend using the same plane all the time? Good pullouts are all a matter of proper timing or lead. You must know your airplane and have enough confidence to let her ride. The difference between a good pullout and a splat is about 1/30 of a second, but it's being done every day. The latest rules have loosened up the radius requirements on climb, dive and wingovers. It's 7 feet, so take advantage of it. Watch your tendency to overcontrol on

sharp pullouts which causes a bobble on the end. Something to think about: The four eights are worth 160 points while all the other maneuvers are worth 180. Work on those eights because they represent winning or losing. The others are important too so don't neglect them.

Appearance is not worth much in points, but should be a matter of pride. Once you have decided how long your lines need be, don't ever change for that ship! We have good reason for that statement. At the '54 Nats we flew? the "Hesperus" in stunt. Practice was on 60' lines but we decided to make our first official on 70' lines. Gad—what a mess. Flight resembled a wounded flounder. We had little or no tug most of the time. On 60's before and after she flew fine, not marvelous, just fine. Now we design for 67' wires and use nothing else. U-Reely users, daub some paint on your wires so you'll be able to get the same length each flight.

The AMA pattern is a good one. It will tell the whole story of pilot and airplane. The climb, dive and wingovers check untimed square corners. Loops show up your ability to judge flight path coincidence and smoothness. The square and triangles loop judge your timing of square corners as does the square eight. The eights are timed maneuvers which work the ship in three separate planes. Landing and take off are in accordance with the laws of nature. So after looking at a whole pattern the boys can be separated from the men with the confident feeling that all have been judged fairly and squarely. And how.

(This is the second in a series of stunt articles by this author)

Gramps

(*Continued from page* 21)

used to make Gramps. There was no plan, the ship being made "in air", so to speak. Many flights were made with a K-45 battery and three intermediate flash light cells, two on the Babcock Mark 2 escapement and one for filament. But flights grew ever longer so the three intermediates were increased to six, which the ship carries without difficulty. In fact, the glide is more penetrating and efficient. One almost never has to change batteries and, regardless of the number and length of flights, can fly for many weeks before a drop of even one-tenth is noted on the filament.

Anyone who can build an RC model has no need of directions, especially since materials are noted on the plan, which is available full size. However, a few background facts are interesting.

The ship is so designed that with a .19 engine and a sport fuel, a high altitude will be reached slowly on about an ounce of fuel. This was true of the Veco .19, which seemed to be unusually economical. A two-ounce tank gives a very long flight with at least two spin-downs necessary to avoid climbing out the top. The props were 11-4's and 10-5's. The former is a bit the lazier. Even in a nose-light, nose-up position, the plane will complete 360's under the power once the turn is established. On a hotter fuel, with faster climb, however, the ship will break out of the turn, once begun, before 360, and resume climbing straight-away, unless the rudder is held long enough to put the nose down into a racing turn.

If trimmed tail heavy, Gramps will hang almost motionless in the glide but will not swoop off, out of the wind. It is better, of course, to have a faster glide because tip-stalls, on a gusty day, frequently cause what looks like an interference spiral which may make more than

a full turn before opposite rudder effects a save. Unlike the Live Wire, to which Gramps is a distant cousin, due to its Rebel inspiration, this ship cannot be rocked back and forth near the ground before touch-down to affect a flare out. The amount of dihedral prevents yawing. If a flare-out on rudder is desired, a slight turn has to be started about 6 to 8 feet off the ground, then opposite rudder applied and held. Due to designed-in downthrust (not apparent to the eye), resulting from the positive angle of both wing and tail, the launch is apt to go out flat. Therefore, as is true of any such ship, a lower pitch prop, such as a 10% or an 11-3, may pull the ship into the ground before the wing lift builds up with increasing air speed. Low pitches are for the birds anyway, since, after a nose-down launch the climb tends to become mushy and the plane "drops dead." If the launch can be affected with a moderate pitch, the rest of the flight is lighter on its feet, and not so locked into rigid grooves. This is not ideal for all manner of stunts but we are talking here of a sport ship not expected to stunt.

Materials and covering are of the strongest. The ship is extremely strong. For rudder only, some weight can be wasted (from the multi man's point of view) for sturdier frame and bigger batteries. Heavy nylon was used throughout with six coats of aircraft butyrate plasticized with six drops of castor to the ounce, followed by three coats of colored butyrate. Color scheme was red and blue.

Battery packs with soldered cable-and-plug leads were used. With big batteries there is no replacement problem—besides a spare set, cable and all, can be carried. If you use boxes, it is suggested that, if possible, the top nose opening be made bigger, and the boxes arranged on a vertical sliding tray, the box bottoms forward. If placed under a false floor in the cabin, retrimming is necessary. If you use metal boxes, be absolutely certain to wrap rubber bands around the boxes or to spring load the ends for a reliable contact under vibration. Wing hold dowels are extra thick. Quarter-inch thick dowels simply are not dependable in pull outs, especially after oil soaking. The rubber weather-stripping applied around the cabin edges was fastened with Pliobond. This keeps out dirt and exhaust fumes, helps prevent wing shifting and rattling. The facing-front dowels through the windshield are far better than a dowel across the top front of the cabin, which like as not, will rip up the bulkhead in a crash. The shock gear was the second on the plane—others have used it, so Gramps borrowed the idea. Wheel position is back far enough to encourage experiments with take-offs.

Wing loading is 16 oz. per square foot and power loading is 420 oz. The power is adequate. (*Continued on page 62*)

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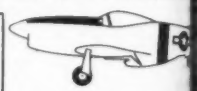
40¾" Wingspan—For .29 to .65 Engines

A total of 15,329 Thunderbolts were produced during World War II and was one of the most famous fighter bombers ever built. Eight .50 caliber machine guns. 2,300 h.p. Pratt & Whitney R-2800 engine. 426 m.p.h.



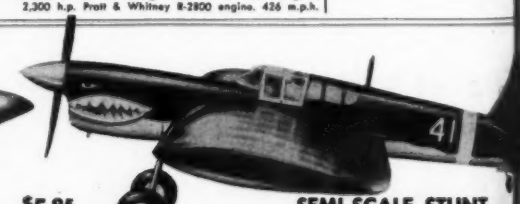
- Deep Drawn Metal Cowl
- Complete Full Color Decal Insignia
- Complete Metal Hardware
- Formed Landing Gear
- Rubber Wheels
- Full Size Detailed Plans
- Completely Pre-Fabricated Wood Parts

For Stunt Events and Navy Carrier

53" Wingspan

For .19 to .36 Engines

$6.95



$5.95

SEMI-SCALE STUNT

"P-40 WARHAW

For .19 to .36 Engines — 45" Wingsp...

This beautiful semi-scale stunt controline won first in Open and first in Senior at the Tangerine Internationals. Die-cut balsa; silk-screened celluloid canopy; complete metal hardware including Jim Walker "U-Control"; metal cowl; fuelproof Flying Tiger decals; stunt flaps.

Bob Elliot's

SEMI-SCALE STUNT

GRUMMAN "GUARDIAN"

Designed as a Torpedo bomber, the "Guardian" was modified as a search aircraft for anti-submarine operations. Two models were flown, AF-2W equipped with electric gear served as a "hunter" while the AF-2S carried the bombs and acted as the "killer". Powered by a 2,400 h.p. Pratt & Whitney R-2800 fourteen cylinder radial engine. Carries crew of four. Range 1,500 miles—maximum speed 315 m.p.h.

TRAINERS

$5.95

$5.95

North American "T-28"

For .23 to .36 Engines — 30" Wingspan

This new Air Force Trainer aligns itself on the Step-Keel, included in kit. Tri-cycle landing gear, metal cowl, bubble canopy, U-Control.

Beech Aircraft's T-34A "MENTOR"

For .14 to .29 Engines — 33" Wingspan 1" Scale

Proportions of the T-34A are perfect for Controline flying. Easily assembled by the "Step-Keel" method, the fuselage is balsa planked. The wing is reinforced to absorb landing impact. "U-Control" is used together with the optional "Autotrol" Rudder system. Decals are complete and include even the smallest details.

NORTH AMERICAN AT-

(U. S. Navy Designation SNJ-5) **"TEXA**

Wingspan—¾" scale—For "19" to "33" Engines

$4.95

The "T-6" has been taught more people to fly than any other airplane. Hundre... thousands of pilots who flew this plane will thrill to see this model perform. Beauti... look at and easy to handle. With its stunt airfoil, it can do everything in the rule ...

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BERKELEY MODELS INC

WEST HEMPSTEAD, NEW YORK, U.S.A.

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA ... Hempstead, N. Y. Please include 25¢ packing & postage

TWIN ENGINE BOMBER

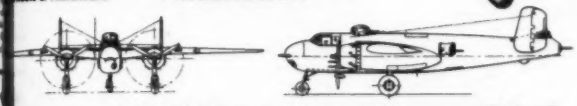
Pre-Fabricated *Controlliners*

Embodying the finest in design, with completeness found only in a Berkeley Kit, these models will satisfy the exacting modeller.

...ed & Hollowed Fuselage
...ed & Hollowed Nacelles
...ed Metal Engine Cowls
...plete Full Color Decals

...ed Canopies & Turrets
...els & Hardware

- Pre-fabricated Balsa Parts
- Full Size Detailed Plan



For .09 to .019 Engines — ⅜" Scale — Big 42" Wingspan — 33" Overall

All Balsa Construction — No Paper Covering Required!

Berkeley's

$12.95

North American B-25 "MITCHELL"

General Jimmy Doolittle's Historic "Tokyo Raider"

- 3-WHEEL RETRACTABLE SHOCK MOUNTED LANDING GEAR
- OPERATING WING FLAPS

With twin engines screaming, the B-25 roars across the field. In 100 feet it's airborne and the gear retracts. With lessened drag and increased speed, it's responsive to every control. Who can tell it from its prototype as throttled down, it settles in for a power on landing, flaps down, gear down and locked. Individually shock mounted gears flex upward and rearward on impact. Gun the engines now and off you go again. Perfect for the Navy Carrier event, this detailed scale replica is easily assembled from this masterful kit.

...jet air intake for Jetex cooling, thrust aug-
...No access hatches to mar finish. Jetex unit
...set scale size jet exhaust opening with extra
...full depth ply wing spar plus sheet planking
...support engine nacelles under landing impact.

...wo .045 to .099 Engines plus Jetex 100,
...or Johnster 150 unit, for exact scale power.
Wingspan — ¾" Scale from factory plans.
...tex unit for reserve power & scale effect)

KIT FEATURES:

Carved & Hollowed Fuselage!
Carved & Hollowed Nacelles!
Five Metal-Hub Rubber Wheels!
Complete Decals!
Embossed Bubble Canopy!
Deep-Drawn Metal Engine Cowls!
Shaped Leading & Trailing Edges!
Die-Cut Ribs, Bulkheads, Etc.

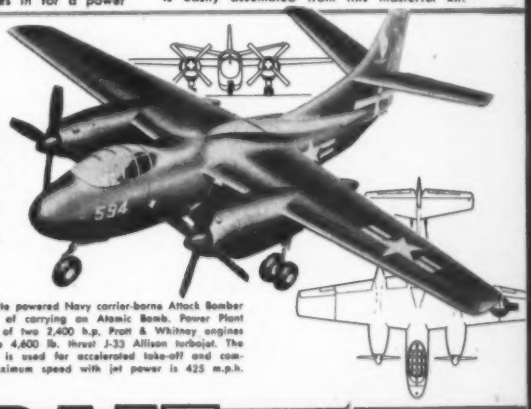
We urge you to see this kit. Few airplanes lend themselves to model work as well as this Atomic Carrier Bomber. It is designed for active flying, with none of the usual frailties. Carved fuselage and nacelles make it very easy to assemble. Climbs on one engine, uses Jetex (internally mounted) for scale effect and reserve power only. Perfect scale throughout!

$6.95

North American AJ-1 "SAVAGE"

U. S. Navy Atom Bomb Carrying Fighter!

(No deviations from scale on this model)



Composite powered Navy carrier-borne Attack Bomber capable of carrying an Atomic Bomb. Power Plant consists of two 2,400 h.p. Pratt & Whitney engines and one 4,600 lb. thrust J-33 Allison turbojet. The turbojet is used for accelerated take-off and combat. Maximum speed with jet power is 425 m.p.h.

PERSONAL AIRCRAFT

$5.95

...SSNA "195"

...9 to .49 Engines
...6" Wingspan

This beautiful lightplane features Step-Keel construction. Formers are positioned by a removable jig. Metal cowl, die-cut parts.

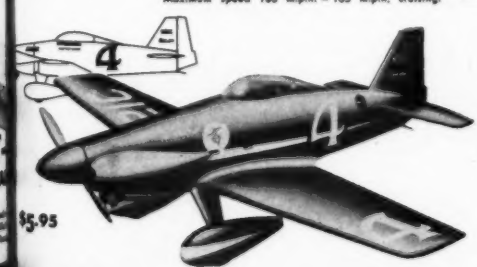
U.S.A.F. designation LC-126A. This five place cabin monoplane was designed for business flying. The Air Force has used the "195" for Arctic rescue work fitted with ski landing gear. 300 h.p. Jacobs engine. Maximum speed 180 m.p.h. — 165 m.p.h. cruising.

$5.95

"SHOESTRING"

.14 to .36 Engines — 28" Wingspan

This Continental Trophy winner makes a perfect controline kit includes metal hardware; formed metal wheel pants; metal spinner; formed sheet metal landing gear; metal bushed rubber wheels; die-cut balsa; plastic bubble canopy; fuelproof decals; hardwood mounts; die-cut plywood; covering material; full size detailed plans.

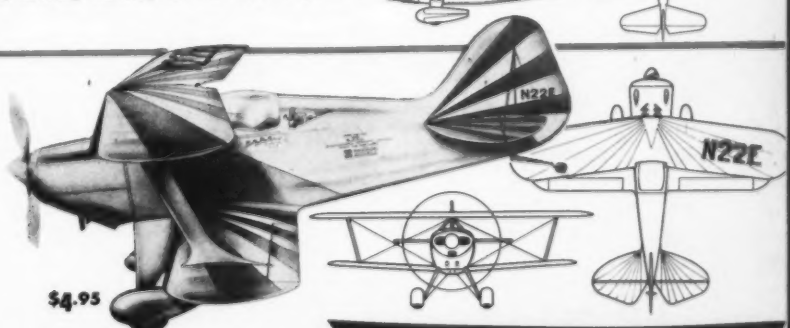


$5.95

"MINNOW" Cosmic Wind

For .09 to .36 Engines — 28" Wingspan

Probably the most famous Goodyear Racer of all. Step-Keel Fuselage, wheel pants, metal spinner, cowl, complete decals, canopy, U-Control.



$4.95

Betty Skelton's "PITT'S SPECIAL"

For .19 to .33 Engines — 25½" Wingspan

This colorful stunting biplane stands apart on any field. Decals include red flare design. Metal cowl, wheel pants, celluloid, etc.

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BERKELEY MODELS INC.,

WEST HEMPSTEAD, NEW YORK, U.S.A.

In the side view, the front cabin former may seem confusing. The main bulkhead is ¼" sheet as always. But, due to position of the front wing hold-on dowels, it is impractical to drop in a wide receiver slide when the receiver is mounted vertically—the dowel thickness would be cut away more than desirable. So, a second bulkhead, made of ⅛" sheet, is constructed behind the main bulkhead and separated from it by ¼"x½" filler strips. The only reason for this second bulkhead is that, in the unlikely event of a hard, vertical crack-up, the receiver slide is supported evenly. Otherwise, weighty objects, as the relay, would crack the slide and, once in motion, perhaps break the main bulkhead as well.

The battery cable is twisted from #24 stranded wire. A hole is made near the bottom of the main cabin bulkhead, near one side, so that the plug can be led into the cabin and to the socket. The receiver tray should not extend to the cabin floor--this leaves open the special hole for the battery cable.

The builder may substitute wood torque rod to move the rudder. If metal is used as on plan, solder a thin piece of flexible wire, in a half loop, between the rod and the contact on the escapement that is connected to the frame. It probably isn't necessary, but is a precaution, to slip some non-metallic covering over the linkage arm at the rear of the plane where it goes through the rudder yoke. On long flights you can build your own interference with rattling metal parts, especially on hard-tube receivers. This effect is especially pronounced where control impulses are few and far between.

Man at Work

(*Continued from page 7*)

reports Stan Hill, the California doctor who whips up potent free flights, doesn't like present complex rules and classes. He favors Half A and the rest combined. Also a four-minute limit. Free flighters sound off, but note that the rules always apply. International Rules, says the Bulletin, are going to the cleaners. "Here's to less emoting and more thoughtful objectivity in the deliberations about to take place," said the Bulletin for Sept., Oct. And you can say that again.

* * *

And from the Hot Head, another fine Canadian bulletin, Vancouver Gas Model Club (Frank Rutland, 2344 West 8th Ave., Vancouver 9, B.C.), sage comments: "... saw juniors overpowering their ships (free flights at Canadian Nats—Ed.) Lots of power good for skyrocket climbs, but if you can't control the power, you can't control the crack-up that follows. If you get away with it, looping all over the sky, it will do you no good as far as winning is concerned. It may look good to you simply because it is flying, but it just doesn't pay off."

Yes sir, the whole struggle is to control power, keep an airplane in one piece, not to design a better flying machine than your neighbor's. Look at the Ramrod. Number One free flight. Why? Because it handles power. Carl Goldberg, you rascal, why did you ever bet on that 99 in a 4½ foot airplane? From the 1939 Nationals in Detroit, until the 1956 Nationals, we've come from the Zipper to the Ramrod. In 17 years we've confirmed

ADVERTISING INDEX—JAN. 1957

your idea on handling power. Some progress!

• • •

Glory Be! A letter from J. C. Butler, Weatherford, Tex., saying, "Never have I had so much fun with a free flight as I've had with the Ramrod. It is even better than the old Comet Zipper!" . . . December 9th was to have been the day of an AAA contest, in the Atlantic City Convention Hall. Local Exchange was to put up $800 in trophies for four events. Speed, all classes, but not jet; stunt, junior and open; Carrier, all ages combined; flying scale, ditto. Indoors, U-control! Whatever became of microfilm? . . . 3c stamp will get you any one of these bulletins: Jet Engine Data, Stunt Patterns, Flight Log Book, Fuel Formulas, Wood Craft Models Catalogue, AMA Data, Speed Indicator, Propeller Chart, R/C Registration —from America's Hobby Center, 152 West 25th St., N.Y.C. Bulletins free; stamp is for postage. . . . Joe Smith, alias Kilroy: sign the letter and we'll take up professionalism in RC. . . . Aviation Week gave two columns to the Wakefield contest, at Hoganas, Sweden, with emphasis on the Russian models and team. Last month, we mentioned the "condenser paper" covering, and took a rain check. Now, Av Wk states that the ribs were made from strong, thin grass from the Steppes, with spruce reeds to form a geodetic structure. The Russians were reputed to have said that the grass was lighter and stronger than balsa. . . . Akron Council of Model Builders (Duane Sanders, 190—2nd St., N.W., Barberton, Ohio), had 130 contestants at Sept. 23rd meet, first big contest in the rubber city in 7 years. Huge success was a beginner's stunt pattern for juniors and seniors only. This event drew more contestants than combat! A gold mine . . . Teachers, take note: Circular No. 381, Aviation Periodicals, for Teachers and Pupils, published by Office of Education, Washington 25, D.C., prepared by Willis Brown, was revised as of June 1956. Lists periodicals of interest as teaching aids . . . Addison Evans, Port Arthur, Tex.—they think big, like we said —has lawn-mower motor in 6 ft. 6 in. stunt model, that weighs 13 pounds less engine, and has a pull of 40 pounds at 70 mph. It has logged 8 hours without breaking an 18 inch prop. Short 70 foot lines will be lengthened to 100 feet. Engine is a Sears Roebuck two-cycle rotary engine by Power Products Inc. Evans cut it down from 15 pounds to three. Ship is a scaled up Zilch—Jim Saftig, where are you?—and an RC escapement gives three speeds via insulated lines. Evans is putting the engine in a midget racer now. His next airplane? A flying outboard. Over and out—like a light.

• • •

Czechoslovakia won both the World Championship for both gliders and speed, September 28-October 3, at Florence, Italy. Though we had personal representatives in speed, only one flight was made, to place 28th. Proxy flown, our gliders placed 40, 48, 60. Team-wise we were last among 16 nations in glider, next to last in speed.

• • •

This is a resounding disgrace. Speed times at home are the fastest in the world. If we can't do better than this, we should stay home. We should not insult the foreign countries with this inexcusable horsing around. More on this next month. The Czechs are top-notch modelers and unquestionably earned their victories.

Berkeley

proudly presents another

FAMOUS HISTORIC AIRCRAFT...

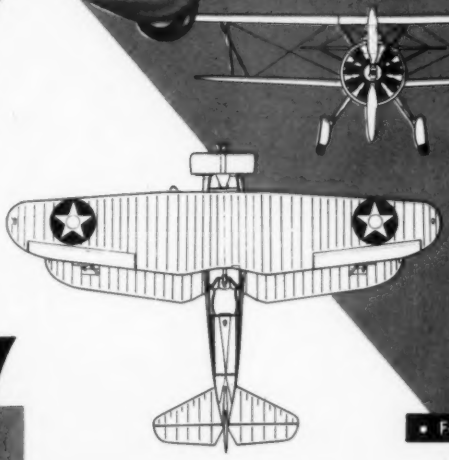
For .074 to .15 Engines—
¾" Scale—23¾" Wingspan

U. S. NAVY

CURTISS "GOSHAWK"
F11-C2

$4.95

- Metal Engine Cowl Ring
- Full Size Berkeley Detailed Plans
- Authentic Multi-color Decals
- Shaped Leading and Trailing Edges
- "U-Control" Elevator
- Die-Cut Balsa Wheel Pants
- Die-Cut Balsa and Plywood Parts
- Stamped Metal Wing Struts
- Metal Hardware and Covering Material
- Plastic Dummy Engine
- Side Profile Fuselage Assembly Keel
- Formed Wire Landing Gear, Rubber Wheels
- Automatic "Autotrol" Rudder Control



The "Goshawk" is another great historical model and was the Navy's Counterpart of the Famous Army Hawk. Flown from the famous "Lexington" and "Saratoga" carriers, they trained the young pilots who were destined to be the Navy's Air Leaders in World War II. A spectacular model!

Thrill to the perfect scale realism as your "Goshawk" taxis across the field, gathering speed as you gun the engine, and screams airborne with all the realism and maneuverability of the prototype. No wonder the hot biplane fighters of the mid thirties are top favorites for Navy Carrier type events.

Construction is fast and easy, thanks to pre-shaped blocks, formed cowl, struts, shaped wing edges etc. At your dealer—

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WEST HEMPSTEAD, NEW YORK, U.S.A.

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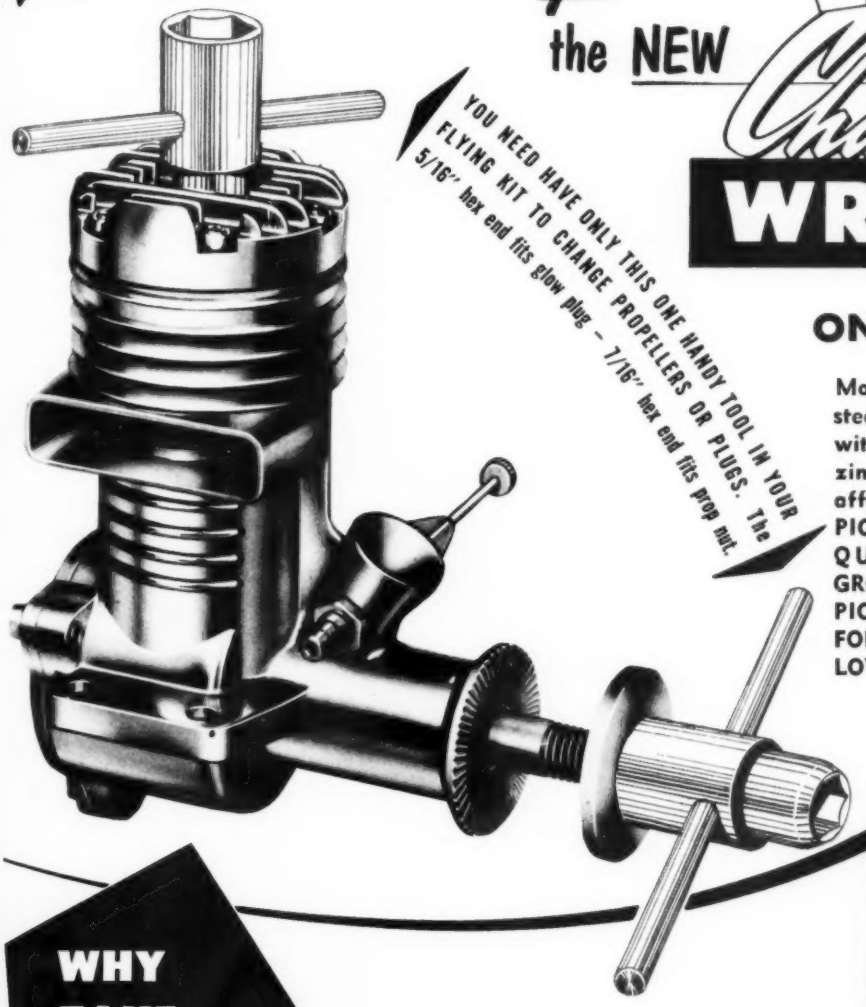
Announcing the NEW Champion WRENCH



YOU NEED HAVE ONLY THIS ONE HANDY TOOL IN YOUR FLYING KIT TO CHANGE PROPELLERS OR PLUGS. The 5/16" hex end fits glow plug – 7/16" hex end fits prop nut.

ONLY 60¢

Made of quality, heat-treated steel. Don't confuse this wrench with those made of die cast zinc, cheap sheet metal or tube affairs. THIS NEW CHAMPION WRENCH IS ANOTHER QUALITY ITEM IN THE GROWING LINE OF CHAMPION PRODUCTS. WATCH FOR OTHER ITEMS TO FOLLOW.

WHY TAKE CHANCES? . . . USE FOX SUPERFUEL

Fox Superfuel — the number one choice of George Aldrich, 3-time Nationals Stunt Winner . . . first choice of Bill Cummings, 2-time Nationals Stunt Winner.

85¢ pint

Champion PRODUCTS

MANUFACTURED AND GUARANTEED BY

P. O. BOX 1175-A
FORT SMITH, ARKANSAS

Berkeley's RADIO CONTROLLED FLYING SCALE Design

FOR RADIO CONTROL — FREE FLIGHT and CONTROLINE

These designs have been selected as ideal for Radio Control flying. Thrill to the majesty of a perfect scale replica as it wheels to your command high overhead.

CESSNA "172"

- **Adjustable Ailerons** for manually setting trim
- **Operating Wing Flaps** radio or controline actuated
- **Laminated Structure** stronger, lighter, easier

To lighten, strengthen and simplify assembly, the areas you would normally have to plank or carve from block are now die-cut laminations.

$6.95

BIG 1⅓" SCALE — 54" WINGSPAN FOR .09 to .19 ENGINES

Here is the latest scale "Cessna" that is a "natural" for radio control. The big proto ship takes-off and lands with "hands-off" control. The model handles just as easy! It's a model builders dream ship!

The kit is very complete in true Berkeley tradition with prefabricated wood parts, silkspan, landing gear and hardware, plus the super-detailed plans and full-colored authentic decals found only in Berkeley Kits.

NAVION "Super 260"

For .29 to .35 Engines Radio Control

For .23 to .29 Engines Free-Flight

For .29 to .65 Engines Controline

(U.S.A.F. designation: L-17) A four place business airplane also used by the U.S. Army and Air National Guard. Originally built by North American Aviation. Power—260 h.p. Lycoming. Maximum speed—163 m.p.h.

$13.95

2" Scale — 68" Wingspan

This beautiful scale replica of the famous "Navion" a fast, rugged and truly different R.C. or Free Fl design, easily adapted to Controline Flying. Thrill its flashing performance and smooth response. A free-flight, it will give you experience and confide in low wing designs. Big, roomy, and well engineer it will set the pace whenever it's flown. Easy to bu

$8.95

Radio Control — Free-Flight — PAA-Load

.15 to .25 Engines—71" Span—2" Scale

"PIPER CUB J-3"

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.

Army Liaison YL-24

"HELIOPLANE" $3.95

Variable Camber Wing for Two-Speed Radio Control Flying

For .049 to .14 Engines — 39" Wingspan — 1" Scale

The "Helioplane" is the first model that permits the use of scale wing flaps. Depress 10 degrees for free flight; 25 degrees for slow speed control by radio; or raise wing flaps 5 degrees for high speed flight!

48 in. Wingspan

De Havilland

"BEAVE

- **Formed Metal Ring Cowl**

This high aspect-ratio Canadian Bush Flying type aircraft is in use by the U.S. Air Force. As a scale design, it is proportioned and capable of contest performance. In R.C. Controline flying, its long moment arm make it ideal for landings with motor control, Metal Cowl, Full Size Plan,

Radio-Controlled, Free-Flight, Controlline

Radio-Controlled, Free-Flight, Controlline

Piper

"TRI-PACER"

.44 in. Wingspan .035 to .15 Engines **$5.95**

This perfect scale R.C. design may be built as a Free-Flight or Controline version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio. Highly Pre-fabricated, Authentic Decals.

$10.95

CESSNA "170"

Radio Control — Free-Flight — PAA-Load .25 to .35 Engines — 72" Span — 2" Scale

Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger than average size makes it easier to control in windy weather.

Since 1933—Leader in Creative Model

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